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PRACTICAL NOTES.

By Robert F. Fairthorne, Ph.G.

Solution of Hypochlorite of Zinc.—This is proposed as a disinfecting and bleaching liquid, possessing advantages over Labarraque's solution of "Chlorinated Soda" in several particulars. The disinfecting and bleaching properties of hypochlorous acid are in this preparation combined with the astringent and antiseptic virtues of the zinc compounds, and, being free from alkalinity, this solution could be used with better effect than the liquor sodæ chlorinatæ for many purposes, and could be, moreover, employed as a gargle, injection or lotion less diluted with water, thereby enabling the physician to bring more chlorine or hypochlorous acid in contact with the surface to which it may be applied.

I would also propose it as a bleaching liquid for textile fabrics, and, on account of its freedom from caustic properties, believe it would be of considerable value. The formula by which the solution of hypochlorite of zinc can be made is the following:

Take of Chlorinated Lime, . . .	12 troyounces
Sulphate of zinc, . . .	24 "
Water, ...	12 pints

Dissolve the sulphate of zinc in 3 pints of water. Triturate the chlorinated lime, a little at a time, with portions of the water added slowly, and mix thoroughly with the remainder of the water. Allow it to stand until the lime has subsided. Pour off the clear liquid. Transfer the sediment to a muslin strainer, and allow it to drain until sufficient liquid has passed to measure 8 pints with the decanted portion of the solution. Mix this with the solution of sulphate of zinc, and, having set it aside for 12 hours, pour off the clear portion of the liquid and place the remaining portion on a piece of muslin to drain. Mix these liquids, and pour more water on the precipitate, if necessary, so as to make 11 pints and a half of the finished product.

The reader will observe that I have followed the formula of the Pharmacopœia for making solution of chlorinated soda, substituting sulphate of zinc for carbonate of sodium, even the same quantities being used. This is on account of the similarity of molecular weight. Theoretically, the solution of the zinc salt made by this process should be stronger than the soda solution, as there is more zinc in 24 ozs. of the sulphate than there is of sodium in the same weight of carbonate, the latter salt containing 10 equivalents of water to 7 of the former.

Coloring for Tooth Powder, etc.—An unobjectionable color for tooth powder can be made by dissolving 1 oz. of the best carmine in 6 fluid-ounces of stronger solution of ammonia, and adding this to a portion of the precipitated chalk in a large mortar, using sufficient quantity to absorb the liquid. This is triturated with more of the carbonate of calcium until enough is added to bring it to the state of powder. This is then allowed to dry, and, when free from the smell of ammonia, mixed with the other ingredients of which the dentrifice is composed. The quantities given are sufficient to give a brilliant pink tint to thirteen pounds of tooth powder. By making a solution of carmine in ammonia a more thorough diffusion of color is effected, and 1 oz. of carmine used in this way will be equal to about one and three quarter ounce when used as a powder.

Cleaning Mortars, Slabs, etc.—Mortars in which oil, balsam or grease have been mixed should first be thoroughly scraped with a spatula, then wiped out with paper, next with a piece of cotton batting slightly moistened with spirits of turpentine, and, lastly, with cotton moistened with a little soap liniment, and washed with water. By this treatment tar, oil, grease, petroleum, balsams, iodoform, asafœtida and resins can be effectually removed and much time and annoyance saved. Stains from iodine are best removed by rubbing a few grains of iodide of potassium and a very small quantity of water together, which forms a concentrated solution in which iodine is soluble. For permanganate of potassium stain use muriatic acid. Indigo will be removed by strong sulphuric acid.

The Administration of Cod Liver Oil.—So much has been written upon this subject that the reader might think that the subject has been exhausted by this time. However this may be, I do not remember ever having seen the following method suggested.

That this substance possesses valuable and special properties not

common to other oils cannot be doubted. It has now been in general use at least thirty years, if not longer, and its sale is larger to-day than ever before; so, any means employed whereby it can be more readily taken without causing disgust may be of service to some poor sufferer who has to use it daily.

If to each ounce of the oil are added f℥ii of tomato catsup or walnut catsup, and well shaken whenever required for use, a mixture is formed which many persons to whom I have recommended it have found quite palatable, and to agree with the stomach better than any other form in which it had been taken. There appears to me to be a reason for this, namely, the association of substances generally employed as additions to food, thereby bringing into operation those digestive faculties of the stomach which otherwise might remain dormant when such incongruous substances as sugar and one of the principal ingredients of fish are introduced together into the stomach, as is done when emulsions are given. What would be thought of eating cod fish or lobster with a dressing made of sugar and gum? This would require, perhaps, some effort to swallow, yet not more so than is required of some poor consumptive, with weak digestion, when some of the saccharine mixtures of cod liver oil are presented to him. Another, and not unpalatable mixture, can be made and often taken readily by the patient, which consists of

Liebig's extract,	½ an ounce
Extract celery seeds,	½ fluidrachm
Vinegar,	1 fluidounce
Water,	2 fluidounces
Cod liver oil,	5 "

Dissolve the extract of beef in water, add the vinegar and oil, shake well together with the extract of celery.

The Solubility of Borax Increased by Sugar.—Having frequent occasion to prepare the glycerol of borax, the thought occurred to me that perhaps sugar might have the same effect as glycerin in increasing the solubility of that salt, and in this I find that I am not mistaken; for, upon mixing 50 grains of borate of sodium with 180 grains of sugar and 6 fluidrachms of water, I notice that perfect solution occurs, whereas without the sugar only 22 grains will dissolve in that quantity at 60°F. The increased solubility is probably due to a chemical compound being formed in the same manner that sugar unites with sodium chloride, and forms a crystalline salt that is described as being

very deliquescent. The tendency to unite with magnesium, calcium and barium oxides leads me to think that solution is effected by forming a salt more soluble than borax, and in this connection I would state that I think that the increased solubility of this salt in glycerin is due to the same cause. I intend to devote more attention to this subject in the future.

THE ORTHOGRAPHY OF THE METRIC UNITS.

By Prof. Jos. P. Remington.

The short paper on this subject, by the writer, in the January number of the "American Journal of Pharmacy," has called forth several rejoinders from the advocates of the modified orthography—two editorials and a paper from Prof. Oldberg, published in the February number. So far as is known, the subject has not been ventilated before in the journals, and the proposed adoption of the terms in the text of the forthcoming Pharmacopœia undoubtedly calls for a consideration of the subject.

The first argument advanced by Prof. Maisch is against the writer's proposition to retain the word *meter* as a measurer, as applied to the measuring of coal, gas and water, which is its present use, and use *metre* the original word for the first unit of the metric system. He says, "The French employ the word *mètre* for the abstract measure as well as for the measuring instruments;" and raises the question, "Why change the spelling for the unit itself, and make a *metre* (the abstract measure) to be measured by a *meter*." The answer to this is, that in the English language we would continue to adhere to the custom of calling the *measurer* of a yard not a yard, but a yard stick; and of a foot not a foot, but a foot rule; and thus by analogy we would call the measurer of a *metre* a metre stick, and for the subdivisions the *centimetre rule* would be used; and even the Metric Bureau have used these additions to the terms to designate measures; and upon this subject Prof. Oldberg remarks (p. 57, February number), "If we must insist upon great nicety in preserving the original spelling, we would write *thermometre*, and that a thermometer is a heat measurer and not a heat measure Professor Remington will, of course, admit." The reply to this is that, *thermometre* is merely the French word for a *thermometer;* this word did not originate with the French as did metre, litre and gramme as units in their system, for the instrument was first

used by the Dutch in the 17th century, and the German *thermometer* was in use before the French *thermomètre*. This writer's plea is not to introduce French words into the English language because they are French, but simply on the ground of priority and right to retain original words, particularly when they accord with the genius of a language, are well established and understood, and overwhelming reasons cannot be given for a change.

The changing of gramme to gram is, of course, a matter of greater importance than the other changes, because in pharmacy this unit would be the one most largely used. Prof. Maisch admits that in France and Italy the abbreviation gr. is used for gramme, and in central and northern Europe grm. or gm., and he says, "In formulas it is scarcely possible to mistake the one value for the other because the quantities of the different ingredients would indicate at once whether gr. referred to the value of the old or metric system—." The grain and gramme must, in this country and in England, both be used at the same time, and apothecaries must keep both kinds of weights. Many illustrations could be given where it would be very inconvenient, not to say dangerous, to use for *gramme* an abbreviation at all similar to that for *grain*. A medical writer in a journal in using a preparation, possibly a new remedy, says he gives it in doses of two gr. How much does he mean? The country doctor orders the two gr. put into a package and mailed to him. How much is to be sent? Where there are a number of ingredients in a formula it is admitted that there should not be serious errors; but does it not confess a great weakness in *the proposed use of a system* which, in the main, is distinguished above all others for simplicity and perspicuity, that one must *depend* upon the relation of the quantities of the different ingredients in the formula to sufficiently indicate whether grains or fifteen and a half times the quantity is wanted?

Prof. Oldberg says in his paper that, "gr. is not the adopted abbreviation of gram, but gm. is the abbreviation used." It cannot justly be said that either of the abbreviations have been adopted in this country. *Gm.* is, indeed, recommended in his admirable little work "Metric Weights and Measures for Medical and Pharmacal Purposes," but in examining copies of the very large amount of literature sent out annually by the Metric Bureau, to aid in the introduction of the system in this country, the writer failed to notice the abbreviation *gm.* once. If any abbreviation can be said to be adopted it is one

which is quite as objectionable as any proposed, namely, g. This is the lithographed and stereotyped abbreviation adopted by the Bureau, seen on their Putnam's Metric Charts, also in the metric nomenclature adopted by the Bureau and American Metrological Society; see "Metric System of Weights and Meausures" (J. Pickering Putnam, p. 59), the "Metric Manuel," "Metric Primer," "Metric Bulletins," and a book just issued, "Bradbury's Eaton's Practical Arithmetic." In the present state of confusion and want of uniformity, this writer maintains that it would be far better to avoid abbreviations entirely until the system is thoroughly introduced and understood. One mistake—the loss of a life through a blunder, caused by defective abbreviation—would give the system a greater blow and give its enemies more aid and comfort than all of the arguments that they have brought to bear against it. In advocating the use of the word *gramme* in pharmacy, the claim that is made by the writer is that, practically, it is a better word than *gram*, because *gram* more closely resembles *grain* than *gramme* does, and is much more likely in writing to be mistaken for it.

The following prescription might mean relief to the patient if the i is dotted clearly, or death if it was omitted:

℞ Sulphate morphia, 1 grain.
Divide in ten powders; use as directed.

If *gramme* was the authorized orthography there could be no defence in case of mistake, whilst if g., gr. or gm. were used the druggist would be in doubt in the first two cases and also in the third case if imperfectly written, as would very likely be the case. The spelling of *gramme* in full could not be regarded by the physician as a hardship, for by using this one term once at the head of his prescription he is saved the necessity of repeating ℨ, ʒ, ℈, gr. for each ingredient, as in the present method.[1]

Prof. Maisch is of course correct in stating that, "in the metric prescriptions of continental Europe 10·0 means ten grams," and the writer can go further than this, and say that metric prescriptions are frequently written in this way in this country, particularly by physicians who have been educated abroad, yet the practice of *indicating quantities by their absence*, and trusting to an understanding that when no quantity is specified that grammes are meant, *cannot be regarded as*

[1] If an abbreviation should be found necessary for prescription purposes, the Greek letter Γ, Gamma, might be used, although the writer prefers the word gramme spelled out.

a safe one, and is irrational to adopt in a country which has not made the system compulsory, and in case of death resulting from accident, brought about by a misunderstanding, censure from a coroner's jury, an indictment for manslaughter or a civil action for loss of support could be instituted, with a very fair chance of success on the part of the plaintiff; and even abroad, where the system is established, accidents continue to happen from this practice; for example, a physician of Sangerhausen, in Germany, wrote the following prescription: "Chlor. hydr., 15·0; tinct. opii, 15; aquæ, 60·0. M. A third part to be administered in the evening as an enema." The patient died, and a prosecution was instituted against the physician and apothecary who dispensed his prescription. It seems that the physician, in writing the prescription, had it upon his mind to order a little laudanum to the solution, and thought fifteen drops would be about right, and by an unfortunate "lapsus" followed out his usual practice of not designating a quantity, and, of course, the prescription as written contained a fatal quantity of tincture of opium. It unfortunately happened to fall to the lot of a junior assistant to compound the prescription, and he put the quantities in as written for, without carefully examining the directions to the patient, and sent it out with the result before stated. The court took the view that all of the parties concerned in making the blunder were blameworthy, and sentenced the doctor to one month's imprisonment, the apothecary to two months and the assistant to three months. Gross carelessness would be the universal verdict, and yet this life would not have been lost if the proper quantities had been designated.

This paper has largely outgrown the limits which the writer intended for it, and the apology is that, although the subject seems a trifling one, viewed superficially, it becomes of considerable importance when the question is to be decided—which orthography shall be adopted by our Pharmacopœia Committee?

The original orthography, *metre*, *litre* and *gramme*, is at present officinal. Although the metric system is not used in the text, it is used in *tabular* form in the United States and British Pharmacopœias, and the orthography is the original. Upon those who desire to alter the adopted orthography must fall the duty of sustaining the *onus probandi* in asking for a change. If, after due consideration, it is the judgment of the committee that the alteration should be made, it will then be the duty of all to loyally uphold the will of the majority.

THE PREPARATION OF FORMIC ETHER.

By Henry Trimble, Ph.G.

Having occasion to prepare considerable quantities of this ether, and finding the process in which sodium formate is employed a long and tedious one, it occurred to me that it might be made by adding alcohol to the acid during its formation from oxalic acid and glycerin. I have since found the fact mentioned in an English text-book on chemistry, but as no formula is given I offer the following, with the hope of benefitting those who have never met with the statement.

Ten parts each of oxalic acid and glycerin with one part of water are heated in a flask, connected with a condenser, for about 12 hours, at a temperature between 100° and 110°C. When effervescence has ceased a small quantity of liquid will be found in the receiver, but as that is largely water it may be rejected. To the mixture in the flask, consisting of glycerin and formic acid, is added four parts of alcohol, and the whole kept at a temperature not exceeding 50°C. for several hours. It is then submitted to distillation, continued until the thermometer indicates 120°C. The distillate is found to consist of two layers. The upper ethereal one is separated, washed with water containing a little sodium hydrate, and distilled.

The yield is about four parts, specific gravity ·910 at 15·5°C., while theoretically it should be eight parts, a loss which may be accounted for. By adding five parts of water to the contents of the flask and distilling, a moderate quantity of formic acid will be obtained. It was thought that if alcohol were added instead of water an additional amount of the ether might be obtained; but this is not the case, because the acid is so diluted by the glycerin that it will not combine with the alcohol. There is always a great loss when the ether is manufactured from sodium formate, therefore this process is offered as not only being cheaper but also as furnishing a purer product with less trouble and in less time. It may not be out of place to mention that amyl formate may be prepared in the same way, therefore, in all probability, the formates of the other radicals.

Philadelphia, Feb. 14, 1881.

RESEARCHES ON THE CONSTITUTION OF THE CINCHONA ALKALOIDS.

By O. Hesse.

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As is well-known, a great deal of uncertainty still prevails in regard to the condition in which the oxygen is contained in the more common cinchona alkaloids.

Zorn ("Journ. für prakt. Chemie" [2], 8, 279) believes to have proved the presence of hydroxyl in these alkaloids, in that he has supposed to have found that by the action of highly concentrated hydrochloric acid upon these bases, the hydroxyl may be exchanged for chlorine; the further statements of Zorn, however, in regard to the supposed chlorides, influenced the author to regard these bodies as addition products (Liebig's "Annalen," Bd. 174, p. 340). This view, indeed, did not meet with the acceptance of Zorn ("Journ. für prakt. Chem." [2], 14, 281). According to the author's supposition, the hydroxyl groups, if such were really present, should have become transferred to the new bodies, and there remained, therefore, after the opposition of Zorn, nothing further than to examine whether, in the first place, with the original alkaloids, and then with their respective derivatives, evidences were at hand which would speak indubitably for the presence or absence of hydroxyl groups therein.

For the solution of the problem the study of the behavior of these bodies bodies towards acetic anhydride appeared to be the most suitable, with the view that if hydroxyl were really present it would, by proper treatment, be converted into acetoxyl.

I. *Action of Acetic Anhydride on the directly obtainable Cinchona alkaloids.*[1]—It is stated by Wright and Beckett ("Jahresber. für Chem.," etc., 1876, p. 813) that by the action of acetic anhydride upon quinia and quinidia (conquinia), acetylquinicia, and by the action of the same upon cinchonidia and cinchonia, acetyl-cinchonicia is formed.

The author has found that when the before-mentioned alkaloids, homocinchonidia included, are treated with acetic anhydride at 60° to 80°C., the acetic ethers of the same are formed; instead of the free

[1] Homo-cinchonidia has been included in this investigation, as from the statements of Zorn it is undecided whether he worked with cinchonidia, homocinchonidia or a mixture of the two.

alkaloids the salts of the same, as the neutral hydrochlorate and sulphate, may be employed. After a few hours the formation of the compound ether is completed, and the solution, after the addition of a little water, may be evaporated in a capsule at a moderate heat. The amorphous residue is then dissolved in water, a slight excess of ammonia water added, and the compound ether extracted by shaking with ether. The ethereal solution, after being washed with cold water, is allowed to evaporate slowly, when the acetyl compound remains behind. With the exception of the acetyl-quinia, all these compounds are amorphous; they may be dried at 100°C. without decomposition, and are resolved when boiled with an alcoholic solution of potassa, with absorption of a molecule of water, into acetic acid and the original alkaloid. It may thus be easily proved that the product obtained from quinia and quinidia is free from quinicia, and that that from cinchonidia, etc., is free from cinchonicia. The saponification even takes place when the compound ethers are allowed to remain in contact with a solution of caustic potassa or soda for a long time at ordinary temperatures. The compound ethers dissolve readily in dilute acids, and are precipitated from these solutions by ammonia, potassa or soda in a resinous form. While the solutions of acetyl-quinia and acetyl-quinidia in an excess of diluted sulphuric or acetic acid show a blue fluorescence, this property is not displayed by the respective solutions of the other compound ethers. With alcohol all these compound ethers form solutions possessing an alkaline reaction and strongly bitter taste, and of these again the acetyl-quinia and acetyl-quinidia solutions assume, with chlorine and an excess of ammonia water, a deep green color, while the solutions of the other compound ethers do not show this reaction.

Acetyl-quinia, $C_{20}H_{23}(C_2H_3O)N_2O_2$, is obtained by the evaporation of the ethereal solution in colorless, shining prisms, which after the removal of the mother-liquid and washing with a little ether, are perfectly pure. It melts at 108°C. (uncorr.), and solidifies on cooling in radiating crystals; it is easily soluble in alcohol and chloroform, but more difficultly in ether. Its solution in 97 volume per cent. alcohol gives at $t=15°$C., and for $p=2$ a rotation of $[a]_d = -54{\cdot}3°$, and for the same amount in water with 3 molecules HCl, $[a]_d = -114{\cdot}8°$. The *platinum* salt forms a dark yellow amorphous flocculent precipitate, sparingly soluble in cold water and in dilute acids. The *gold* salt forms a bright yellow flocculent precipitate, which gradually becomes crystalline.

Acetyl-quinidia (*conquinia*), $C_{20}H_{23}(C_2H_3O)N_2O_2$, has the same pro-

perties as acetyl-quinia, with the exception that it is perfectly amorphous, dissolves somewhat more readily in ether, and deviates the plane of polarized light to the right, giving for the solution in alcohol +127·6°, and in water with 3 molecules HCl, +158·6°. By saponification there is naturally formed from this compound neither quinia nor quinicia, but quinidia. The *platinum* salt is obtained as an amorphous flocculent precipitate, which soon becomes crystalline, and is sparingly soluble in water and dilute acids. The *gold* salt is a beautiful yellow amorphous precipitate, which, on drying with exposure to the air, becomes pulverulent.

Acetyl-cinchonidia, $C_{19}H_{21}(C_2H_3O)N_2O$, forms, after drying at 80° to 100°C., a brittle mass, yielding a white powder, melting at 42°C. (uncorr.) It is very readily soluble in ether, alcohol and chloroform, but sparingly in water; its solution in alcohol deviates the plane of polarization —38·4°; in water with 1 molecule HCl, —66·6°, and with 3 molecules HCl, —81·3°. A neutral, concentrated, warm aqueous solution gives a milky precipitate with the tartrate of sodium and potassium, which again disappears on cooling. The *platinum* salt is obtained as a yellow flocculent precipitate, which soon becomes transformed into aggregations of orange-red, wort-like crystals. The *gold* salt is a beautiful yellow amorphous precipitate, having the formula, $C_{19}H_{21}(C_2H_3O)N_2O,2AuCl_4H.+H_2O$.

Acetyl-homocinchonidia has the composition of the preceding compound, and resembles it except that it furnishes by saponification in alcoholic solution no cinchonidia, but homocinchonidia, and in its solutions acts somewhat more feebly on polarized light, the values obtained being —34·0°, —61·1° and —72·5. The *platinum* salt is an orange-yellow amorphous precipitate, gradually changing into dark orange-colored crystals. The *gold* salt is a beautiful yellow amorphous precipitate, almost insoluble in cold water.

Acetyl-cinchonia is amorphous, melts at a low temperature, and has, when dried at 100°C., also the formula $C_{19}H_{21}(C_2H_3O)N_2O$. It may be reduced to a white powder, which is easily soluble in ether, alcohol and chloroform. Its solution in alcohol shows a rotatory power of +114·1°, and in water with 3 molecules HCl, =+139·5°. Its *platinum* salt forms orange-red crystals. The *gold* salt is a yellow amorphous precipitate.

II. *Action of Hydrochloric Acid, spec. grav.* 1·125, *on the Cinchona alkaloids.*—After having proved that quinia, quinidia, cinchonidia,

homocinchonidia and cinchonia contain each a hydroxyl group, it was further to be determined whether, by the action of highly concentrated hydrochloric acid, as applied by Zorn, a further decomposition or perhaps molecular change of the respective alkaloids did not precede the reaction in view. The author has previously shown how easily the quinia disulphate passes into quinicia salt, the cinchonidia disulphate into cinchonicia salt, etc.; and the further observation was made, that by the action of hydrochloric acid on quinamina, according to the concentration of the acid and other circumstances, quite different results are obtained, which should be more closely considered. It was, indeed, found that the alkaloids in question—quinia, cinchonidia and their isomers—cannot resist the action of hydrochloric acid, spec. grav. 1·25, but that when subjected to this treatment in sealed tubes at 140° to 150°C. for from 6 to 10 hours, a molecular change takes place, whereby at the same time, in the case of quinia and quinidia, chloride of methyl is formed; the latter partially condenses under the pressure produced in the tube to a mobile, strongly-refractive liquid, which, upon opening the tube, becomes immediately dissipated. As the formation of the chloride of methyl repeatedly resulted in the explosion of the tubes, it was considered advisable not to employ more than 2 grams of quinia or quinidia hydrochlorate with about 10 cc. of hydrochloric acid for each tube, and further, to cool the tubes well with ice before opening. With cinchonidia, homocinchonidia and cinchonia this precaution was not necessary, as after heating not the slightest pressure was found in the tubes; and for these alkaloids, therefore, a larger amount (4 grams to 12 or 15 cc. acid for each tube) were employed for the reaction. By this treatment there are produced, without the formation of other substances,

from Quinia and hydrochloric acid : Apoquinia and chloride of methyl,
from Quinidia and hydrochloric acid : Apoquinidia and chloride of methyl,
from Cinchonidia " " : βCinchonidia and apocinchonidia,
from Homocinchonidia " " : Apocinchonidia,
from Cinchonia " " : Apocinchonia and diapocinchonia.

Apoquinia, $C_{19}H_{22}N_2O_2$ (anhydrous).—The acid solution is diluted with cold water, gradually precipitated by ammonia, the voluminous, flocculent, yellowish-white precipitate is washed with a little cold water, dissolved in acetic acid and treated with animal charcoal. After the brownish-yellow color has changed to a bright yellow the solution gives, upon the addition of excess of ammonia, a white flocculent precipitate, which, after washing with cold water, dries in the form of white,

crumb-like masses, furnishing a white powder. Apoquinia is perfectly amorphous, has a bitter taste and alkaline reaction; it dissolves readily in ether, chloroform and alcohol, also to some extent in cold, and more readily in hot water; ammonia and caustic soda dissolve it quite readily when freshly precipitated, but with difficulty when air-dry. It melts at 160°C. (uncorr.), and acquires a brown color. With sulphuric acid in acid solution apoquinia shows no fluorescence, but its alcoholic solution still gives, upon the addition of chlorine and an excess of ammonia, a feeble greenish-yellow coloration. The rotation of the anhydrous alkaloid, or dried at 100°C., in alcohol, was found to be —178·1°, and in water with 3 HCl, —246·6°. The airdry alkaloid contains $2\,H_2O$, a small portion of which is lost in dry air. Apoquinia neutralizes the acids completely, although the salts appear to have little inclination to crystallize. The following were more closely examined:

The Neutral and Acid Hydrochlorates dissolve readily in water and alcohol, and are obtained by the evaporation of these solutions as amorphous residues.

Neutral Tartrate.—If the aqueous solution of the neutral hydrochlorate be mixed with a little Rochelle salt no precipitate is formed, but after the addition of a considerable amount of the latter salt a cloudiness appears, and the apoquinia tartrate separates as an oily mass, readily soluble in cold water.

The Chloroplatinate is a yellow flocculent precipitate, readily soluble in dilute hydrochloric acid, but slightly soluble in cold water. The *gold* salt was obtained as a reddish-yellow resinous mass, which was not further examined.

Apoquinidia (*Apoconquinia*), $C_{19}H_{22}N_2O_2$, resembles apoquinia perfectly in appearance and composition, but it is exceedingly difficult to obtain a perfectly uneffloresced hydrate. It is a white amorphous powder, readily soluble in alcohol and ether, possesses an alkaline reaction and gives, in its alcoholic solution with chlorine and ammonia, a green coloration; its solution in sulphuric acid shows no fluorescence. It deviates the plane of polarized light to the right, in alcohol + 155·3°, and in water with 3 HCl +216·5°. Apoquinidia is precipitated by ammonia or soda in white voluminous flakes, difficultly soluble in an excess of these bases; the alkaloid deprived of water, by drying at 120°C., melts at 137°C. (uncorr.) The neutral *hydrochlorate* crystallizes in needles, and is readily soluble in water and hydro-

chloric acid; its aqueous solution becomes milky on the addition of iodide or sulphocyanide of potassium solution, and produces finally resinous precipitates. The *chloroplatinate* is a beautiful yellow, amorphous, flocculent precipitate.

Apocinchonidia, $C_{19}H_{22}N_2O$, into which alkaloid also β cinchonidia, produced from cinchonidia, is transformed by longer heating, being very sparingly soluble in moderately dilute alcohol; its preparation in a pure state presents no difficulty, and even by recrystallizing the crude product once from boiling alcohol, the pure base may be obtained. It crystallizes in small, shining laminæ, difficultly soluble in ether and chloroform, and almost insoluble in cold water; the alcoholic solution has an alkaline reaction. It melts at 225°C. (uncorr.), acquiring a dark color; it deviates the plane of polarized light to the left, dissolved in alcohol, −129·2°; and in water with 3 HCl −160·4°. It dissolves readily in dilute acids and is precipitated from these solutions by ammonia or soda in white amorphous flakes, which, after a short time, become crystalline. Its solutions have a strongly bitter taste, and are not fluorescent. The neutral hydrochloric acid solution is not precipitated by Rochelle salt until completely saturated with this salt, when a small amount of a resinous precipitate is produced, which, however, upon the addition of water again disappears.

The *neutral hydrochlorate*, like the *neutral sulphate*, is amorphous and readily soluble in water and alcohol. The *chloroplatinate* forms at first a flocculent precipitate, afterwards becoming crystalline, and is very difficultly soluble in water.

Apocinchonia, $C_{19}H_{22}N_2O$.—For the separation of the apocinchonia from diapocinchonia the contents of the tube are nearly neutralized by ammonia, then an equal volume of alcohol is added, the mixture heated to boiling, and mixed with an excess of ammonia; the apocinchonia is thus precipitated, and after the solution has become cold may be collected, washed with diluted alcohol, dried between filtering paper, and finally recrystallized from boiling alcohol. It is in colorless prisms, melting at 209°C. (uncorr.), insoluble in water, difficultly soluble in ether and chloroform, but quite readily soluble in alcohol, particularly on boiling; the alcoholic solution has an alkaline reaction and bitter taste. It deviates the plane of polarized light to the right, dissolved in alcohol +160·0°; in water with 2 HCl +212·5°, and with 3 HCl +212·3°. Apocinchonia crystallizes anhydrous, dissolves readily in acids, and is precipitated from these solutions by ammonia or other

alkalies in white amorphous flakes, which after a short time become crystalline. If dissolved in its molecular weight of sulphuric acid and a little water, and this solution be evaporated to dryness, it becomes colored brown, even at 120°C., but at from 130 to 140°C. is completely and without loss of weight converted into *apocinchonicia*.[1] Apocinchonia forms with the acids, which it completely neutralizes, some well crystallizable salts, of which the following were more closely examined.

The *neutral sulphate* $(C_{19}H_{22}N_2O)_2.H_2SO_4.2H_2O$, forms colorless, star-shaped groups of delicate needles, which are readily soluble in alcohol, chloroform and hot water.

The *neutral hydrochlorate* is obtained as glittering, concentrically grouped, silky needles, which are readily soluble in alcohol and water. The *chloroplatinate* is an amorphous, flocculent, dark yellow precipitate.

Diapocinchonia, $C_{38}H_{44}N_4O_2$, remains dissolved in the alcoholic mother liquid of the apocinchonia. This solution is neutralized with hydrochloric acid, the alcohol evaporated, the liquid supersaturated with ammonia, and the alkaloid extracted by agitation with ether, on the evaporation of which it is obtained usually contaminated with a little apocinchonia, from which it may be freed by treatment with the smallest possible quantity of absolute ether; after decolorizing the ethereal solution with animal charcoal, the alkaloid is obtained as a pale yellow mass, yielding a white powder. It has an alkaline reaction, dissolves readily in ether, alcohol and chloroform, and deviates the plane of polarization to the right, dissolved in alcohol $+20{\cdot}0°$, and in water with 3 HCl $+23{\cdot}6°$. The solution in hydrochloric acid separates the alkaloid upon addition of an excess of ammonia or soda in a resinous form; it forms with the acids neutral and acid salts, of which the following were more closely examined.

The *neutral oxalate*, obtained by neutralizing the alcoholic solution with oxalic acid, forms an amorphous, scarcely hygroscopic mass, which is readily soluble in chloroform. The *neutral hydrochlorate* is likewise

[1] Apocinchonicia is in its free condition very unstable; it is amorphous, dissolves readily in ether, alcohol, chloroform and dilute acids, and is precipitated from the latter solutions by caustic potassa or soda in a resinous form. It appears to have no action on polarized light. Its *neutral oxalate* is *amorphous*, and the alkaloid is therefore different from cinchonicia. Its platinum salt is a yellow flocculent precipitate, which gradually becomes crystalline, and the composition of which corresponds to the formula $C_{19}H_{22}N_2O$, $PtCl_6H_2+2H_2O$.

amorphous, and readily soluble in water. The *chloroplatinate* is a yellow, amorphous, flocculent precipitate. The *gold salt* is a beautiful yellow, amorphous precipitate, but slightly soluble in water and in dilute acids.

The diapocinchonia is formed from the apocinchonia by the long continued action of hydrochloric acid, and differs from cinchonicia, apocinchonicia, and from the naturally occurring dicinchonia.

(To be concluded in the next number.)

Chinese White Wax.—From an article in the "British Mail" on the white wax industry of China, it seems that the average annual value of this peculiar crop amounts to about £650,000. From Hankow alone upwards of £81,000 worth of this wax was exported in 1879. The Chinese white wax is a deposit found on twigs of *Ligustrum lucidum*, and caused by the puncture of an insect. It is said that in Keenchang district the plant thrives in great abundance, and in the spring of the year the twigs are covered with countless swarms of flies having the appearance of a brown film. The branches soon became covered with a white soap-like incrustation, which increases in volume till the commencement of the fall of the year, when the sprays are cut off and immersed in water which is kept boiling. The viscid substance rises to the surface, and is skimmed off, melted and allowed to cool in deep pans. It was accidentally discovered that, by transporting the insects from their native districts to the more vigorous one of Keating-fu, in the north of the province, their power of discharging wax was largely augmented—a property which was promptly and extensively availed of by the Sze-chuen traders. The period between evening and morning is chosen for conveyance, because many hours of sunlight would precipitate the hatching. This should take place only after the females have been attached to the trees. Arrived at their destination, six or more of the mothers—which are enormously prolific—are tied, wrapped in a palm leaf, to a branch of the ligustrum. A few days later the young flies are swarming on the twigs, where they fulfill their mission by the month of August; then they perish in the cauldrons, where the results are immediately collected. It is stated that this peculiar industry requires the exercise of great care and forethought.—*Pharm. Jour. and Trans.*, Oct. 16, 1880, from the *Gardeners' Chronicle*, Oct. 2, 1880.

CONSTITUENTS OF THE AUSTRALIAN ALSTONIA BARK.

By O. Hesse.

Reprint from Liebig's "Ann. der Chem.," Band. 205, pp. 360 to 371. Communicated by the author. Translated and abridged by Fred. B. Power.

The author reported in 1865 on an Australian bark ("Ann. der Chem.," 4 Suppl. Bd., pp. 40 to 50) which since then has proved itself to be the bark of Alstonia constricta. The same bark was examined in 1863 by Palm, and a bitter principle, *alstonin*, obtained therefrom by precipitating the aqueous decoction of the divided bark with tannic acid, and then treating the precipitate, which was a compound of the bitter principle with tannic acid, in the proper manner. According to Palm, this bitter principle is a resin *free from nitrogen*, and therefore no alkaloid.

The course which was previously followed by the author for obtaining one of the alkaloids of alstonia bark, the chlorogenina, led to the supposition that this alstonin, in spite of the maintained absence of nitrogen, consists principally of chlorogenina; and, indeed, a control experiment, which was made with a small specimen of an authentic bark obtained from Prof. Flückiger, has confirmed this supposition. In view of this fact, the author has no hesitation in calling the alkaloid in question *alstonina*, as the latter designation is older than the former, although the name "alstonin" has in course of time repeatedly been given to other substances.

Thus, Baron von Müller, in Melbourne, to whom the previous examination of the *Australian* bark by the author was evidently unknown, in his work on "The Organic Constituents of Plants," p. 239, abandons the designation of alstonin for Palm's substance, and transfers it to a body which was obtained by himself and L. Rummel (see "Am. Jour. Phar.," 1879, p. 406). Oberlin and Schlagdenhauffen afterwards gave the name alstonin to a crystallizable alkaloid, extracted from the bark by means of ether (see "Am. Jour. Phar.," 1879, p. 407, 408). The author had been taught by an experiment, before knowing of the communication of Oberlin and Schlagdenhauffen, that ether extracts a basic substance from the bark, which agrees essentially with his porphyrina. A later attempt to separate this mass by means of ether into a crystallizable and amorphous portion had a negative result, which induced the author to subject the bark to a new examination, the results of which are communicated in the following.

It was at first confirmed that the extraction of the bark with ether furnishes only a small portion of the alkaloids, which, however, consist chiefly of porphyrina. As it was desirable to obtain the larger portion of both alkaloids, and the properties of chlorogenina and porphyrina having been known to the author, a method was adopted which led to the desired end. The alcoholic extract of the bark was dissolved in water, and this solution supersaturated with sodium bicarbonate, whereupon a brown flocculent substance, evidently a decomposition product of chlorogenina or alstonina, was precipitated, and filtered off. The clear filtrate was now treated so often with petroleum ether, and this with small amounts of dilute acetic acid, until nothing more of consequence was extracted. In this way porphyrina and other substances soluble in petroleum ether were removed from the carbonic acid solution, while the alstonina (chlorogenina) remained dissolved in the lower liquid.

Alstonina (syn. chlorogenina) is obtained when the carbonic acid solution, as above, is supersaturated with caustic soda and shaken with chloroform. There results a blackish-brown chloroformic solution of the alstonina, which, after clear filtration and the addition of sufficient water and acetic acid, is freed from the chloroform by distillation. The residual acid solution is filtered in order to separate small amounts of brown flakes, and then treated with animal charcoal, whereby, in addition to coloring matters, a considerable amount of the alkaloid was precipitated which it was not sought to again obtain. The solution purified in this way was precipitated with caustic soda; a brownish-yellow amorphous flocculent matter soon subsided, but could not be washed sufficiently upon the filter. The mother liquor was therefore removed as completely as possible by thrice repeated decantation with cold water, which manipulation was very successful, although thereby a not inconsiderable amount of alkaloid became dissolved. This dissolved portion of the alkaloid, however, was not lost, as the entire amount of wash water was afterwards shaken with chloroform.

After the mother liquid is removed the flocculent alkaloid is brought upon a filter and washed with cold water, the organic mass being separated as well as possible from the sides of the filter and divided in the water by means of a platinum knife. The alkaloid is finally brought in thin layers upon smooth filtering paper, dried at a low temperature, and then forms a brown amorphous mass, which may be reduced to a brownish-yellow powder; in the exsiccator it becomes

colored darker, and finally of a coffee-brown color in consequence of the loss of water, which occurs rapidly by heating to 80°C.

The author first applied ammonia for the precipitation of the alkaloid, but it was found to precipitate alstonina very incompletely. For the alkaloid precipitated by ammonia the formula $C_{21}H_{20}N_2O_4+H_2O$ had previously been determined, while now the alstonina precipitated by caustic soda and dried at 120°C. gave the formula, $C_{21}H_{20}N_2O_4$.

Alstonina, freshly precipitated, is readily soluble in chloroform, but less readily when previously dried; it dissolves also readily in alcohol, but sparingly in ether, particularly in the dried form. Its hydrate (containing $3\frac{1}{2}$ H_2O) melts below 100°, while the anhydrous alkaloid melts near 195°C. (uncorr.)

Alstonina is, in opposition to the statements of Palm, a strong base, and forms, therefore, salts with the acids. Some of them were previously (1865) examined, and the platinum salt, as formed by the precipitation of a solution of hydrochlorate of alstonina by platinum solution, has now again been analyzed, the results of which correspond to the formula $(C_{21}H_{20}N_2O_4)_2.PtCl_6H_2+4H_2O$.

In regard to the salts of alstonina, it may be added that its sulphate, hydrochlorate, tartrate and oxalate are readily soluble in water, but that an excess of the acids precipitates the salts as brown flocculent masses. The same behavior as these acids is shown by an acid constituent of the Australian alstonia bark, which is obtained in brown amorphous flakes, and which forms with alstonina an indifferent, difficultly soluble compound. The author considers it very probable that Palm's alstonin consists of the compound just mentioned.

Porphyrina.—As previously mentioned, petroleum ether extracts from the carbonic acid solution several substances, which may be taken up from the former by acetic acid; the latter then assumes a magnificent blue fluorescence, and gives with an excess of ammonia a reddish-white, flocculent precipitate. This precipitate was dissolved in ether and the solution treated with animal charcoal, which absorbed not only a small residual amount of alstonina, but also another basic substance, which could be extracted from the animal charcoal by means of dilute acetic acid. The acid becomes colored thereby of a magnificent purplish-red, and gives then, with an excess of ammonia, a flesh-colored, amorphous precipitate, which, however, soon changes by exposure to the air. This latter circumstance induced the author to aban-

don the further examination of this base, for which the name *porphyrosina* is proposed.

The ethereal solution is now likewise treated with dilute acetic acid and this solution precipitated by ammonia. The dried mass is boiled with a little genuine ligroin; a portion dissolves therein, but from the solution, upon cooling, a certain amount is again separated. The porphyrina remains thereby for the most part dissolved, and can be obtained by the evaporation of this solution, but for its complete purification it is necessary that the alkaloid in acetic acid solution be treated with animal charcoal. The porphyrina precipitated from the decolorized solution by ammonia forms white, amorphous flakes, and upon drying a white, adherent mass, furnishing a white powder. It dissolves readily in ether, alcohol and chloroform, and is again obtained by the evaporation of these solutions in an amorphous condition. The alkaloid, dried in the exsicator, was found to melt at 97° C. (uncorr.) If the alcoholic solution of prophyrina be diluted with much water, a feeble blue fluorescence is observed. Pure concentrated sulphuric acid and that containing molybdic acid dissolve the alkaloid with a purple color; sulphuric acid containing chromic acid with a greenish-blue, the solution becoming gradually yellowish-green. Concentrated nitric acid dissolves the base, as previously stated, with a purple color, which, however, fades quite quickly and passes into yellowish or brownish-green. In acid solution porphyrina shows a blue fluorescence. The amount of porphyrina contained in the Australian alstonia bark is very small, from nearly two kilograms of bark only about 0·6 grm. having been obtained, but which was deemed sufficient for determining the elementary composition. From the results of the analysis the formula $C_{21}H_{23}N_3O_2$ is deducted for the alkaloid, and for the platinum salt, dried at 120°C., the formula $(C_{21}H_{25}N_3O_2)_2 \cdot PtCl_6H_2$, the air dried platinum salt containing in addition 4 molecules H_2O.

Alstonidina was prepared from that portion of the alkaloids difficultly soluble or insoluble in ligroin by dissolving it in the requisite quantity of boiling ligroin, whereupon, on cooling, at first isolated needles and afterwards concentrically grouped needles separated. All attempts to isolate these apparently different substances by crystallization from ligroin were unsuccessful. In the further course of the examination, however, the author succeeded, by means of sulphuric acid, in separating from the crystalline mixture an alkaloid. To this

purpose the mixture was dissolved in a small amount of boiling alcohol and so much dilute sulphuric acid added that the solution perceptibly reddened blue litmus paper. Upon cooling, the sulphate of the new alkaloid crystallized out, which was again dissolved in hot dilute alcohol and decomposed by ammonia. On cooling, the alkaloid alstonidina crystallized in colorless, concentrically grouped needles. It dissolves readily in chloroform, ether, strong alcohol and acetone, and crystallizes on the evaporation of the solvent; it dissolves also readily in hot dilute alcohol, and crystallizes therefrom, upon cooling, in colorless needles. The alcoholic solution has a feeble alkaline reaction and an intensely bitter taste; it shows a blue fluorescence, which, upon dilution with water, increases in intensity. The solution of alstonidina in dilute acids also displays an intense blue fluorescence. Ammonia and caustic soda produce in the latter solutions white, flocculent precipitates, which soon become crystalline. Alstonidina melts at 181°C. (uncorr.)

It produces in alcoholic solution no coloration with ferric chloride; pure concentrated sulphuric acid, and that containing molybdic acid, as also concentrated nitric acid, dissolve the alkaloid without any special coloration, but on diluting with water a strong blue fluorescence appears. Concentrated sulphuric acid, with a little powdered potassium bichromate, dissolves the alkaloid with a blue-green color, fading after a short time, but again appearing with its former intensity on agitation. This color may be made to appear and disappear repeatedly, until finally, even after agitation, merely a greenish color remains. Alstonidina forms salts, some of which crystallize very readily. The *sulphate*, previously mentioned, forms colorless needles, crystallizing readily from hot water; the *hydrochlorate* crystallizes in magnificent long needles, which dissolve readily in water and alcohol; the *hydriodate* crystallizes in small, colorless, stellately grouped needles; the *sulphocyanate* forms white needles, which are very sparingly soluble in water; the *platinum salt* is obtained as a yellow, flocculent precipitate, which dissolves to some extent in boiling water; the *gold salt* also forms a flocculent precipitate, while the *mercuric chloride salt* crystallizes in colorless needles, which are rather freely soluble, particularly in hot water The hydrochloric acid solution of alstonidina yields, with solution of potassium bichromate, at once a yellow, flocculent precipitate, while with porphyrina, by the same reagent, a blood red color is produced. The

composition of alstonidina and its salts could not be determined for want of material.

Alstonidina resembles Oberlin and Schlagdenhauffen's alstonin, but is decidedly different therefrom, for the latter is colored by sulphuric acid containing chromic acid first blueish-green, then violet, and finally purplish-red. The method adopted by these chemists for obtaining their alstonin leads to the supposition that it may have contained a certain amount of alstonidina. That both chemists should have separated their alstonin by crystallization from ether so perfectly from their alstonicin, *i. e.*, evidently the porphyrina of the author, that the latter in acid solution no longer showed a fluorescence, does not seem plausible, for even with the great difference in solubility in ligroin, which is shown by porphyrina and the crystallizable portion of the alkaloids in question, the former cannot be so obtained that it no longer shows a fluorescence. If it be also admitted that porphyrina, as has been more fully described above, was not yet entirely free from alstonidina, it cannot be denied that the amount could be merely a trace, entirely insufficient to explain the blue fluorescence shown by prophyrina in acid solution.

The alkaloids described above do not comprise all which are present in Australian alstonia bark, as is shown from the difference in the crystals mentioned above; at one time the author obtained small scarlet-red needles, which proved to be the sulphate of a new alkaloid, but could not be further examined for want of material.

Burns by Sulphuric Acid.—Mr. Alanore relates the case of a serious accident which occurred during a chemical lecture, in which two students were seriously injured in the face by the explosion of a flask containing boiling sulphuric acid. The remedy applied was a soft paste of calcined magnesia and water, with which the face was covered, in layers two millimeters in thickness. The intense suffering which was first experienced ceased entirely about a quarter of an hour after the application of the remedy, and, although the magnesia requires to be renewed in the course of 24 hours in the case of a severe burn, the patients after recovery retain no marks of the accident.—*Bull. de Thérapeutique.*

CHEMICAL NOTES.

By Professor Samuel P. Sadtler, Ph.D.

Inorganic Chemistry.—*Occurrence of Large Native Deposits of Antimony Oxide.*—According to a report of E. F. Cox there is a very extensive deposit of antimonous oxide to be found in the district of Sonora, Mexico, some 39 miles from the Gulf of California. The district is hilly, the formation being essentially granitic and limestone. The rocks show extensive fissures, in which the metal is found from four to twenty feet in breadth and extending to a depth of thirty feet. The oxide seems almost pure and is very uniform in character. This occurrence extends over a surface of five miles in length and one mile in breadth. It is at present worked by a Boston company. The oxide contains on an average 50 per cent., and in the purer specimens 77 per cent. of metal. The chief impurity is silicic acid. It is likely that below this deposit, in the formations not yet uncovered, the oxide changes gradually into antimony sulphide.—*Chem. Industrie*, iv, p. 12.

Organic Chemistry.—*Detection of Methyl Alcohol in Common Spirit of Wine.*—Cazeneuve and Cotton propose the use of potassium permanganate for this purpose, as it is reduced instantly at ordinary temperature by methyl alcohol, while ethyl alcohol only reduces it very gradually. 10 cc. of ethyl alcohol were treated at 20°C. with 1 cc. of a 1 per cent. solution of potassium permanganate; twenty minutes elapsed before the liquid became yellow.—*Chem. Centralblatt*, Jan. 5, 1881, p. 11.

On Two New Anæsthetics. (See also this Journal, 1880, p. 603).—At the annual meeting of German naturalists held at Danzig, Tauber, in combating Liebreich's theory that chloral owes its power to a formation of chloroform under the influence of the alkaline blood, described two new anæsthetics that certainly do not give rise to chloroform and yet are strong in their physiological action. The first of these, monochlorethyliden chloride, may be called a methyl-chloroform, $CH_3—CCl_3$. It was discovered in 1840 by Regnault, smells like chloroform, and is decomposed with much difficulty by alkalies into acetic and hydrochloric acids, neither of which has any anæsthetic power. We have here a body, which contains the Cl_3 group characteristic of chloroform, has 2 carbon atoms in the molecule, which can exist in alkaline liquids without decomposition and without yielding chloroform at any time, but despite this has an anæsthetic power fully

equal to that of chloroform. Details of experiments upon frogs, rabbits and dogs were given. The speaker had also personally tried its influence. The second anæsthetic is monochlorethylen chloride, $CH_2Cl—CHCl_2$, and is even more satisfactory in its effects than the first mentioned. Both of these anæsthetics effect the pulse and respiration much less than chloroform, and the second compound especially is to be commended for surgical use.—*Ibid*, p. 9.

On the Disinfecting Action of a Mixture of Phenol and Bleaching Powder and the Character of the Chlorophenols Produced.—Mr. Dianin, as reported at the annual meeting of the Russian naturalists, held at St. Petersburg, Jan. 1880, found that on mixing solutions of phenol and "chloride of lime" a reaction at once set in and the chief product was trichlorphenol. This compound was also found to arrest fermentation in a much greater degree than phenol itself, and the mixture above mentioned was therefore recommended by him as much better suited for application to sloughing wounds than phenol itself.

The matter has since been more thorougly studied by C. O. Cech. He prepared the chlorophenols by the direct action of chlorine upon phenol. The crude product was a blood-red crystalline mass of strong odor and burning taste, easily soluble in ether and is much less caustic even in this condition than carbolic acid. By repeated pressings of the crystalline mass between filter paper it is gotten in lustrous white crystals, soluble in ether and precipitable from alcoholic solution by addition of water in the form of white flakes. The alcoholic solution can be used very conveniently for saturating bandages for direct application to wounds.—*Ber. der Chem. Ges.*, xiii, p. 2403, and *Chem. Centralbl.*, Jan. 5, 1881, p. 8.

On the Identity of Arabinose and Lactose.—H. Kiliani has made a careful study of the arabinose of gum arabic, and proves the identity of it with lactose or milk-sugar. For its extraction 1 part of pure gum arabic was boiled for some 18 hours with 8 parts of 2 per cent. sulphuric acid, replacing the evaporated water from time to time. The liquid, after neutralization with barium hydrate and filtration from the separated barium sulphate, was evaporated to syrupy consistence and then extracted with 90 per cent. alcohol as long as anything was taken up. This alcoholic solution af evaporation yielded a reddish colored syrup, which was placed over sulphuric acid and allowed to crystallize. The crystals, when purified by repeated crystallization out of alcohol, were quite difficultly soluble in the menstruum. Kiliani finds that the

arabinose so prepared does yield mucic acid on oxidation, contrary to the statements of Scheibler and Fudakowski, and that like lactose it reduces Fehling's solution even in the cold. It is not excited to fermentation by yeast, nor is pure lactose so excited, although both Pasteur and Fudakowski state the contrary. The optical properties of arabinose and lactose also are identical, both showing the same rotatory power. The action of sodium amalgam upon arabinose as upon lactose gives rise to the formation of dulcite, as was proved by an analysis of the material so obtained. Kiliani suggests, therefore, in view of these results, that the name arabinose be dropped and that the crystallizable sugar of gum arabic be called simply lactose.—*Ber. der Chem. Ges.*, xiii, p. 2304.

Method for the Complete Separation of Albumen without the Use of Heat.—E. Salkowski accomplishes this by the addition of acetic acid or common salt. In a dry flask are placed 20 grams of powdered salt and 50 cc. of blood, and to these are added 100 cc. of a mixture, consisting of 7 volumes of saturated salt solution and 1 volume of acetic acid (acid. acet. dilut., Germ. Phar.). The mixture is then vigorously shaken and allowed to stand 15 to 20 minutes, with occasional shaking, when it is filtered through a dry filter. The filtrate is perfectly free from albumen, nor does it contain any peptone. The precipitate obtained in this way is partially soluble in water and begins to coagulate on heating. The method is frequently available, especially in the analysis of blood.—*Chem. Centralblatt*, Jan. 5, 1881, p. 13.

TECHNICAL CHEMISTRY.—*Mustard Seed Oil.*—The mustard plant thrives in California and grows in such profusion that it becomes a pest to the wheat fields, especially in the coast valleys, as for instance from Alameda south to the Vera Cruz and Pajaro basins. It stubbornly resists extinction, and so grows and overtops the grain with its yellow flowers that a stranger might readily mistake it for the crop intended to be raised.

A small quantity has always been gathered for table use, it being of excellent quality, but of late years it is found to yield an excellent oil adapted even to the uses to which olive oil is applied. It is gathered by Chinamen, who thresh and bring the seed to the oil mart in San Francisco, where they dispose of it at two or three cents per pound. Many who have made trial of it prefer this oil to that made from lard or the olive oil for cooking purposes; it holds out against rancidity

longer than the latter. It is also extensively used to adulterate olive oil.

Mustard seed oil is sold in the San Francisco market at a dollar the gallon in five-gallon cans, and a dollar and a quarter in one-gallon cans. —*Jour. of App. Sc.*, Jan., 1881, p. 5.

A NEW METHOD FOR THE EXAMINATION OF COFFEE.

By F. M. Rimmington.

I think it will be generally admitted that the methods in use for estimating the degree of adulteration in coffee are far from satisfactory as regards definiteness and certainty, and that something approaching nearer to chemical accuracy is very desirable. Little has been done in this direction since the days of the "Lancet" Sanitary Commission.

It may, possibly, not be generally known to analysts that chicory, dandelion and probably some other substances that are used for mixing with coffee, are readily deprived of color by a weak solution of chloride of lime (hypochlorite), and that this agent has very little action on the coffee. When this method is adopted a portion of the coffee should be gently boiled a short time in water with a little carbonate of soda, so as to remove extractive as much as possible; after subsidence the liquor should be poured off, and the residue washed with distilled water. When this has been sufficiently done, a weak solution of the hypochlorite of lime is to be added and allowed to remain, with occasional stirring, until decoloration has taken place, which will probably be in two or three hours. The coffee will then form a dark stratum at the bottom of the glass, and the chicory a light and almost white stratum floating above it, and showing a clear and sharp line of separation.

The chicory after this operation is in the very best condition for microscopical examination, and it is not difficult to discriminate between chicory, dandelion or other substances. Although the lower stratum may be dark, and have all the appearance of coffee, other substances may be present and should be sought for. I have recently met with a substance which is entirely new to me, as a coffee substitute, that is not affected by this treatment.—*Phar. Jour. and Trans.*, Jan. 1, 1881.

NOTES ON CANANGA OIL, OR YLANG-YLANG OIL.

By Professor F. A. Flückiger.

Translated from "Arch. der Phar.," Jan., 1881, Band xv, pp. 24 to 31, by Fred. B. Power.

This oil, on account of its pleasant odor, which by most observers is designated as very exquisite, has acquired some reputation, so that the following notes upon the same, and the plant from which it is derived, may be of general interest.

The tree whose flowers furnish the oil known under the name of Ylang-Ylang, or Alanguilan, is *Cananga odorata*, Hooker fil. and Thomson, from the family of Anonaceæ, for which reason it is also termed in many price lists Oleum Anonæ, or Oleum Unonæ. It is not known to the author whether the tree can be identified in the old Indian and Chinese literature; in the Occident it was first named "Arbor Saguisan," by Ray, and was so called at that time in Luçon. Rumph gave a detailed description of the Bonga Cananga (Tsjampa of the Javanese), as the Malayan designation of the tree is expressed. Rumph's illustration, however, is faulty. Lamarck has made further short reports thereon under Canang odorant and Uvaria odorata. According to Roxburgh, the plant was brought in 1797 from Sumatra to the botanical garden of Calcutta. Dunal gave of Uvaria odorata, or properly Unona odorata, as corrected by himself, a somewhat more detailed description in his "Monographie de la famille des Anonacées," which is chiefly a repetition of the statements of Rumph.

We are finally indebted for a very fine illustration of the Cananga odorata to the magnificent Flora Javæ of Blume; a copy of this, which in the original is handsomely colored, is reproduced with this notice. That the illustration is correct may be accepted from the fact of the author's having seen numerous specimens of the cananga by De Candolle in Geneva, also in the herbarium of Delessert. The unjustifiable appellation Unona odoratissima, which has passed inaccurately enough into many writings, originated with Blanco, who, by his description of the intense perfume of the flowers, which in a closed sleeping apartment produces headache, permitted himself to be drawn to the employment of the superlative odoratissima. Baillon designates as Canangium the section of the genus Uvaria, from which he contends the Ylang-Ylang tree should not be separated. The notice of Maximowicz, "Ueber den Ursprung des Parfüms Ylang-Ylang," contains only a confirmation of the derivation of the same from Cananga.

CANANGA ODORATA, Hook. fil. (One-half the natural size.)

Cananga odorata is a tree attaining a height of 60 feet, with few but richly ramified branches. The leaves, which are arranged in two rows, on short petioles and longly pointed, attain a length of 18 centimeters and a breadth of about 7 cm.; the surface of the leaf is somewhat firm, and only on the under side, along the nerves, slightly downy. The beautiful and imposing flowers amount to as many as four, upon short pedicels. The three lobes of the leathery calyx are finally turned back. The six lanceolate flat petals grow to a length of 7 cm. and a width of about 12 millimeters, are longitudinally nerved, of a greenish color, and, when dried, dark brown. The somewhat bell-shaped, gracefully declining flowers, present a quite pretty aspect, although the flowers of other related plants are far more attractive.

The filaments of Cananga are very numerous; the somewhat elevated receptacle is flatly depressed at the vertex. The green berry-like fruit consists of from 15 to 20 distinct carpels, on rather long pedicels, and enclosing from 3 to 8 seeds, arranged in two rows. The umbel-like inflorescence is situated in the axils of the leaves, or arises from the nodes of leafless branches. The fleshy portion of the fruit is sweetish and aromatic; the flowers possess the most excellent perfume, which is often compared with the hyacinth, narcissus and clove.

Cananga odorata, according to Hooker and Thomson and Bentham and Hooker, is the only species of this genus; the plants, which were formerly classed together with it under the name of Unona or Uvaria, and of which some likewise have flowers possessing a pleasant odor, are retained in these two genera, which are quite rich in species. From Uvaria the Cananga is distinguished by the valvate corolla, and from Unona by the double-rowed arrangement of the seed.

Cananga odorata is distributed throughout entire southern Asia, but principally as a cultivated plant. In the primitive forest the tree grows much higher, but the flowers, according to Blum, are almost odorless. In its habitus Cananga resembles Michelia champaca, *Lin.*, nat. ord. Magnoliaceæ, a tree of India much admired on account of the very pleasant odor of its yellow flowers. Among the flowers which exhale a pleasant perfume, and to which the Javanese in this respect are much accustomed, those to which the preference is given by them, are in the first line the "Tjempaka," Michelia champaka, and the "Kenangga wangi," Cananga odorata.

It is not known to the author whether the oil of Cananga was prepared in former times; it appears to have first reached Europe about

1864, and in Paris and London its choice fragrance found full recognition. The very small amounts which were first imported from the Indian Archipelago were soon followed by somewhat larger consignments from Manilla, where German pharmacists occupied themselves with the distillation of the oil.

Oscar Reymann and Adolf Röusch, in Manilla, exhibited the Ylang-Ylang oil at Paris in 1878; the former had also in addition the Cananga flowers themselves. The oil, standing by its side of the flowers of the previously mentioned Michelia champaca, competes with the Cananga oil, or Ylang-Ylang oil, in respect to fragrance. To what extent the latter has found favor is difficult to judge, although the reduction in price which the same has experienced would speak, probably, for a somewhat larger demand; at present it is to be had in Germany for about 600 marks (150 dollars) per kilogram.[1] As the Cananga tree may be cultivated very easily in all warmer countries, and is probably everywhere provided with the same delightful fragrance of the flowers, it must be possible to furnish the oil much cheaper, although the amount obtained is always quite small (25 grams of oil from 5 kilograms of flowers, according to Reymann). It is a question whether the tree would not flourish, for example, in Algeria, where already so many exotic perfume plants are cultivated.

According to Guibourt, the *Macassar oil*, which was at one time highly prized in Europe as a hair oil, is cocoa nut oil digested with the flowers of Cananga odorata and Michelia champaca, and colored yellow by means of curcuma. In India, ointments of this kind have been in use for a very long time.

The name Cananga is found, moreover, also in Germany, in former times. An *Oleum destillatum Canangæ* is mentioned by the Leipsic apothecary J. H. Linck, under "einigen neuen Exoticis," in the "Sammlung von Natur und Medicin-, wie auch hierzn gehörigen Kunst- und Literatur-Geschichten, so Anno 1719 in Schlesien und anderen Ländern begeben," Leipzig and Budissin, 1719. As, however, the fruit of the same tree, which was sent at the same time with this Cananga oil, is described by Linck as exceptionally bitter, it cannot probably here refer to the present Cananga odorata, the fruit pulp of which is emphatically designated by Rumph and by Blume as

[1] According to information furnished by Mr. Reymann, there are annually consumed in Paris, Nizza and Grasse about 200 kilograms, in London about 50 kilograms, and as much in Germany (Leipsic, Berlin, Frankfurt).

sweetish. Furthermore, an Oleum Canangæ, Camel straw oil, held a place, in 1765, in the tax of Bremen and Verden. It may remain undecided whether this oil was really derived from camel straw, from the beautiful grass Andropogon laniger.

From a chemical standpoint, the Cananga oil has become of interest through the information furnished by Gal that it contains benzoic acid, and without doubt in the form of a compound ether. As well as the author remembers the literature of the volatile oils at the moment, this occurrence of an ether of benzoic acid in nature is an isolated one (not considering Peru balsam and Tolu balsam), although of itself it cannot be surprising, and presumably will be often detected. The author induced Mr. Adolf Convert to examine the Ylang-Ylang oil in this direction. The oil does not change litmus paper moistened with alcohol; at 170°C. a small portion distilled over, but the mercury rose gradually to 290°C., and at a still higher temperature decomposition took place. That the portions which passed over below 290°C. had a strongly acid reaction pointed already to the presence of compound ethers. Mr. Convert boiled 10 grams of the oil with 20 grams of alcohol and 1 gram of caustic potassa for one day in a flask provided with an inverted condenser. The alcohol was finally removed by distillation, the residue supersaturated with dilute sulphuric acid, and together with much water subjected to distillation until the distillate scarcely showed an acid reaction. The liquid which had passed over was neutralized with barium carbonate, and the filtrate concentrated, whereupon it furnished crystals which were recognized as nearly pure acetate. The acid residue, which contained the potassium sulphate, was then shaken with ether; after the evaporation of the latter there remained a crystalline mass of an acid reaction, which assumed a violet color with ferric chloride. This reaction, which is probably to be attributed to a phenol, was not shown after the crystalline mass had been recrystallized from boiling water; the aqueous solution of the purified crystalline scales then gave with ferric chloride simply a slight flesh-colored precipitate. The crystals melted at 120°C.

For the confirmation that the substance was benzoic acid, Mr. Convert boiled the same with water and oxide of silver, and dried the scales obtained on cooling over sulphuric acid. 0·0312 gram of the crystals gave upon combustion 0·0147 gram of silver, or 47·1 per cent.; benzoate of silver contains 46·6 per cent. of metal; the crystals were accordingly, in fact, benzoate of silver. For the separation of the

alcoholic constituent, which is present apparently in not very considerable amount, in the form of a benzoic ether, much more Ylang oil would be required.

Besides the benzoic ether and a supposed above-mentioned phenol, an aldehyd or ketone is also indicated in the Ylang oil, in so far as by shaking the latter with acid sodium sulphite the formation of a very small amount of crystals was observed. That Gal did not obtain the same must remain unexplained. Like the benzoic acid, the acetic acid is also undoubtedly present in the Cananga oil in the form of a compound ether.

Duboisina.—Mr. Duquesnel, a pharmacist, has presented to the French Academy crystallized specimens of the pure alkaloid of *Duboisia myoropoides*. Duboisina, which had previously been obtained only as a syrupy amorphous product of a yellow color, crystallizes in fine colorless needles, grouped around a central point; it is much less soluble in water than the amorphous product, and forms with sulphuric acid a neutral salt, easily crystallizable, deliquescent, and possessing very energetic mydriatic properties. The chemical study will determine in what respects it resembles or differs from atropina, and its physiological study has been undertaken at the laboratory of physiology, under the direction of Dr. Laborde, who will make known the results. —*Jour. de Pharm. et de Chim.*, Jan., 1881, p. 39.

The Ancient Alum Well at Harrogate.—R. Hayton Davis, F.C.S., gives the following constituents in grains in one gallon:

Fe	47·59	Ferric sulphate, . . .	78·76
Al	14·24	Ferrous " . . .	69·33
Ca	16·74	Aluminium sulphate, . .	89·47
Mg	11·47	Calcium " . .	56·91
K	1·40	Magnesium " . .	57·38
Na	13·36	Potassium " . .	3·14
NH_4	0·59	Ammonium " . .	2·19
SO_4	265·44	Sodium chloride, . .	33·96
Cl	20·60	Silica, ...	3·27
SiO	3·27		
	394·70		394·41

Spec. grav., 1005·43. Total residue dried at 360 to 380°, 397·25. —*Jour. Chem. Soc.*, 1881, Jan., p. 20.

NOTES ON VARIOUS FORMS OF LIQUOR OPII SEDATIVUS.

By E. B. Shuttleworth.

Read at a Meeting of the Toronto Medical Society.

It is needless to assert the necessity for a liquid preparation of opium other than the tincture. The extensive use of Battley's solution is, in itself, a sufficient indication of the fact that such a preparation possesses advantages which are not shared by the tincture. Even when therapeutical differences are set aside, there is sufficient reason for the abandonment of laudanum in all cases where nicety of dose is a consideration. It has become an article of too general use with the public to hold its place as a reliable pharmaceutical preparation. Not only is it open to competition in price, but, at the best, the trade standard has been sensibly lowered, so that it is not in accordance with the requirements of the B. P. The tincture is now almost universally made with the moist opium of commerce, which contains from 10 to 20 per cent. of water, while the Pharmacopœia directs dry opium to be used. It will be seen that the strength of the preparation will vary in like proportion, and that in no case will it come up to the official standard. In this connection the fact may be mentioned that analyses of laudanum made in England and on this side of the Atlantic show the variation in morphia strength to vary as much as 300 per cent.

The aqueous preparations of opium in use in Canada, and more particularly in this city, are: Battley's solution; various fluid extracts made by manufacturing firms; solutions made after the model of the tinct. opii deodorata, U. S. P.; ext. opii liquid., B. P.; and a so-called liquor opii sedativus, originating in a recipe of an old Toronto druggist, which is made and largely used by leading pharmacists. When reduced to a tabular form the comparative strengths of these preparations will be more easily seen. The standard I have selected is tinct. opii, B. P., and fractional parts of the minim are omitted:

Tinct. opii, B. P.,	contains	1	grain of *dry*	opium in	15	minims.
Ext. opii liquid., B. P.,	"	1	"	"	11	"
Liquor opii sedativus (Battley),	"	1	"	"	11	"
Liquor opii sedativus (Toronto),	"	1	"	"	4-8	"
Tinct. opii deodorata, U. S. P.,	"	1	"	"	13	"
Various fluid extracts,	"	1	"	about	18	"

These various strengths, ranging very widely, occasion much confu-

sion to the dispenser, and, doubtless, mistakes frequently occur, as also from the fact that prescriptions directed to certain druggists, whose liquor opii sedativus is known to the prescriber, often get astray, and are dispensed at establishments where preparations of different strengths are used. Physicians are, therefore, often disappointed in the results anticipated, and not unfrequently effects are produced of a still more serious character. Uniformity of strength in such a remedy as this is of paramount importance, and I am glad that this Society has taken the initiatory step to bring about such a result.

The question as to what the standard of strength should be is one which does not require much discussion. The *British Pharmacopœia*, an authority which, in these matters, physician and pharmacist are alike bound to respect, has already regulated this matter, and the selection is in all respects a wise one. The liquid extract of opium, B. P., is in strength identical with Battley's solution; the dose, 10 to 30 minims, is one easily remembered, and is not so large as to add unnecessary bulk to mixtures of which it may form a part; nor so small that it cannot be apportioned and calculated with accuracy, and dispensed with ease and safety.

The next point that arises is whether the liquid extract of opium can be accepted as an efficient substitute for Battley's solution, and other proprietary preparations of a kindred character. This is a question not so easily disposed of as that of strength, and as it involves therapeutical considerations, must be left to the decision of the physician. I may, however, perhaps be permitted to make a few observations from a pharmaceutical standpoint, and in order to do this with clearness it will be necessary to allude, however briefly, to the chief constituents of opium, omitting those which are mere chemical curiosities, and presenting the others in the order of their therapeutical importance.

First, then, is *Morphia*, which, in good opium, is present in the proportion of about ten per cent., and is in combination with meconic acid, forming a salt that is soluble in water. (2) *Codeia:* According to Bouchert ("Transactions French Academy," 1872. "Can. Phar. Jour.," vol. vi, p. 136), this alkaloid has about one-third the narcotic power of morphia, but it is feeble and transient in its effects. It is also soluble in water. (3) *Narceine:* This is stated to be about one-eighth the strength of morphia, but Farquharson speaks of it as of little importance except for its anæsthetic properties. It dissolves in water, though not so readily as the foregoing. (4) *Cryptopia:* Not used in medicine,

and has not been much studied, but is stated to be one-fourth as strong as morphia. (5) *Thebaine:* Excitant, anæsthetic, not soporific, no effect in doses of seven grains; slightly soluble in water. (6) *Papaverina:* Has no effect in doses of fifteen grains. (7) *Narcotina.* (8) *Meconin.* (9) *Meconic Acid:* These three constituents are not used in medicine, and according to the authority above quoted, as also Rabuteau and Claude-Bernard, are inert in small doses. Narcotina is insoluble in water. (10) *Resinous and odorous principles:* These are generally believed to produce unpleasant effects. They are only partially soluble in water, and may be modified and partially dissipated by boiling. Soubeiran ("Traité de Pharmacie," i, 851) has shown that the proportion of water put in contact with crude opium exercises an influence on the solution of the resinoid principles, odorous oil and narcotina. Perier ("Bulletin des Travaux de la Société de Pharm.," Bourdeaux, xiii, 245) points out the fact that the quantity of water has an effect on the solution of these principles, a large quantity precipitating the resinous matters, and a concentrated solution having the opposite effect.

From these statements the conclusion may be drawn that a liquor opii tolerably free from obnoxious principles may be made by preparing an aqueous solution of opium, concentrating the liquor by boiling, and redissolving the resulting extract. Such is the liquid extract of the B. P., but in order to effect a more thorough separation of narcotina, meconin, meconic acid, resinous, odorous and extractive matters, I would recommend that the process be repeated several times, and that the resulting liquor be assayed for morphia, and brought finally to such a measure that it shall show, by the pharmacopœial test, a morphia strength of three grains to the ounce, a small portion of spirit being added to preserve the solution from mould and deterioration by age.

That a liquor so prepared will be identical with Battley's solution we have the assertion of Mr. Battley himself, who assured the late Mr. Pereira ("Pereira. Mat. Med.," vol. ii, part ii, p. 2135) that "the only ingredients employed in the preparation of his liquor opii sedativus were opium, water and heat." From my own experience I feel justified in affirming that, with careful manipulation, it is possible to produce a preparation identical with that of Battley, by simply following the process above indicated, but the estimation of the morphia should be particularly insisted on. For the assay of the solution most of the published processes will afford satisfactory results, provided the

performer has sufficient experience; the B. P. method is, perhaps, as good as any. As the morphia strength of commercial opium varies to the extent of some 200 per cent., the necessity for the assay need not be further urged.

The obnoxious principles are, in the U. S. P. process for tinct. opii deodorata, removed by treating the opium solution with ether, but the process is wasteful and troublesome, and gives no better product than that above indicated.

In conclusion I would say that, by the modifications proposed, the B. P. process will furnish a preparation which is in every way satisfactory, and, by adopting the liquid extract, a uniform, legitimate, and comparatively low-priced preparation may be substituted for one which, though reliable, is very expensive, and belongs to a class of remedies which should be discountenanced.—*Canad. Phar. Jour.*, Feb., 1881.

THE STORY OF CINCHONA LEDGERIANA.

The following interesting letter from Mr. C. Ledger, so well known in connection with cinchona cultivation, has been sent to us for publication by his brother, Mr. G. Ledger, to whom it was written:

While engaged in my alpaca enterprise, 1856, I received in the interior of this republic (on the high table plains of San Antonio de los Cobres, in the province of Jujuy), by return of express, that some two months before I had sent to the port of Cobija for letters, funds, etc., a packet of newspapers. In one of the papers I read that Her Majesty's government were sending out to South America a special mission, under charge of Mr. Clements R. Markham, in search of plants and seeds of the cinchona. A Bolivian Indian, Manuel Tucra Mamani, formerly and afterwards a cinchona bark cutter, was then accompanying me, with two of his sons. He had been in my service since 1843. He accompanied me in almost all my frequent journeys into the interior, and was very useful in examining the large quantities of cinchona bark and alpaca wool I was constantly purchasing. I never could get him to ride; he was always at "my stirrup," and would show no fatigue after a journey of fourteen to twenty leagues daily for eight to twelve days consecutively. He and his sons were very much attached to me, and I placed every confidence in them. Sitting around our camp fire one evening, as was my custom after dinner, conversing on all sorts of topics, I mentioned what I had read as to Mr. Markham's mission. Now, Manuel had been with me in three of my journeys into the cinchona districts of the Yungas of Bolivia, where I had to go looking after laggard contractors for delivery of bark. It was while conversing on the subject of Mr. M.'s journey, and wondering which route he would take, etc., Manuel greatly surprised me by saying, "The gentleman will not leave the Yungas in good health, if he really obtains

the 'rojo' plants and seeds." Manuel was always very taciturn and reserved. I said nothing at the time, there being some thirty more of my Indians sitting around the large fire. The next day he reluctantly told me how every stranger on entering the Yungas was closely watched, unobserved by himself; how several seed collectors had had their seed changed; how their germinating power was destroyed by their own guides, servants, etc. He also assured me how all the Indians most implicitly believe if by plants or seed from the Yungas the cinchonas are successfully propagated in other countries all their own trees will perish. Such, I assure you, is their superstition. Although there are no laws prohibiting the cinchona seed or plants being taken out of the country, still I have seen in private instructions from the prefect in La Paz to sub-prefects of Sorata and Caupolican ordering strictest vigilance, to prevent any person taking seed or plants out of the country. More than half a dozen times I have had my luggage, bedding, etc., searched when coming out of the valleys of the Yungas.

So much importance did I attach to all I heard from Manuel, that, as an Englishman, I looked upon it as a duty to advise Mr. Markham and put him on his guard. I consequently addressed him, relating all I had heard, under cover to Mr. George H. Nugent, H.B.M.'s vice consul, Arica, sending by express (on foot, of course) a distance of more than 600 miles. Some two months after I received answer, saying, "Your letter arrived too late. Mr. Markham is now in Carabaya, not having been allowed to enter Bolivia." Although Mr. Markham was unsuccessful upon this occasion, he subsequently succeeded, as related by him in his "Popular Account of the Introduction of Cinchona Cultivation into British India," 1880, and in a book published in 1862.

You are aware how I am looked upon as a doctor by the Indians. Well, one day soon after, when making a decoction from some "coca" leaves, Manuel had brought me the boiling water, I said: "Manuel, I may some day require some seed and flowers of the famous white flower, rogo cascarrilla, as a remedy, and I shall rely on your not deceiving me in the way you have told me." He merely said, "Patron, if *you* ever require such seed and flowers, I will not deceive *you*." And I thought no more about it.

Manuel was never aware of my requiring seed and leaves for propagating purposes; he was always told they were wanted to make a special remedy for a special illness. After much thought, and from my knowledge of him, I question if he would have got them for propagating purposes. He was very much attached to me, no doubt, but he was afraid of his own people.

For many years, since 1844, I had felt deeply interested in seeing Europe, and my own dear country in particular, free from being dependent on Peru or Bolivia for supply of life-giving quinine, remembering and relying on Manuel's promise to me in 1856, and I resolved to do all in my power to obtain the very best cinchona seed produced in Bolivia.

His son Santiago went to Australia with me in 1858. In 1861, the day before sending back to South America Santiago and other Indians who

had accompanied me there as shepherds of the alpacas, I bought 200 Spanish dollars, and said to him: "You will give these to your father. Tell him I count on his keeping his promise to get for me 40 pounds to 50 pounds of rogo cinchona (white flower) seed. He must get it from trees we had sat under together when trying to reach the Mamoré river in 1851; to give my kindest remembrances (and small present) to Fra Simon, curate in the Apolo missions; to meet me at Tacna (Peru) by May, 1863; if not bringing pure, ripe rogo seed, flowers and leaves, never to look for me again; should I not have arrived from Australia, to give seed, etc., to my daughters, who would give him $400." In June, 1863, he sent a nephew to my children at Tacna asking for $200, saying he had not then collected seed for the patron, but by next season would do so if well ripe and not hurt by frost.

I arrived back in Tacna on the 5th of January, 1865, after separation of twelve years from my home and children, completely ruined by the introduction of the alpaca into the Australian colonies turning out a failure.

I at once sent message to Manuel, informing him of my arrival. At the end of May he arrived with his precious seed. It is only now some twenty-four years after poor Manuel promised not to deceive me; manifest how faithfully and loyally he kept his promise. I say *poor* Manuel because, as you know, he lost his life while trying to get another supply of the same class of seed for me in 1872-3. You are aware, too, how later on I lost another old Indian friend, poor Poli, when bringing seed and flowers in 1877.

I feel thoroughly convinced in my own mind that such astonishingly rich quinine-yielding trees as those in Java are not known to exist (in any quantity) in Bolivia. These wonderful trees are only to be found in the Caupolican district, and, as rightly stated by Mr. John Eliot Howard, F.R.S., are only to be met with in eastern Yungas. The white flower is specially belonging to the cinchona "rogo" of Apolo.

You will call to mind, no doubt, the very great difficulties you had to get this wonderful "seed" looked at even; how a part was purchased by Mr. Money for account of our East Indian Government for £50, under condition of 10,000 germinating. Though 60,000 plants were successfully raised from it by the late Mr. M'Ivor, I only received the £50.

The seed taken by the Netherlands Government cost it barely £50. I have recently received advice from the courteous Minister for the Colonies, that he proposes to submit to the State General that £100 be awarded to me.

I see by "The Field" you sent me, containing some account of the propagation of cinchona in Java, that up to this time the seed collected from best specimens has been so well propagated that there are now 707,670 Ledgerianas possessed by the government. At 1d. each that would give £2,948, 12s., 6d.; at 4 pounds of bark per tree, at low price of 8s. per pound, £1,132,272. Seeing the immense present and future wealth resulting from my seed, I cannot sometimes help thinking that I am another illustration of the axiom that "inventors are always losers." As far as I am concerned, I lose in money, having spent more than £600, without taking into

account the labor and anxiety of so many years. Such, then, is the "story" attaching to the now famous Cinchona Ledgeriana, the source of untold wealth to Java, Ceylon and, I hope, to India and elsewhere. I am proud to see my "dream" of close on forty years ago is realized—Europe is no longer dependent on Peru or Bolivia for its supply of life-giving quinia.

C. LEDGER.

—*The Field*, Feb. 5.

VARIETIES.

BORAX IN HOARSENESS.—This salt has been employed with advantage in cases of hoarseness and aphonia occurring suddenly from the action of cold. The remedy is recommended to singers and orators whose voices suddenly become lost, but which by these means can be recovered almost instantly. A little piece of borax, the size of a pea, is to be slowly dissolved in the mouth ten minutes before singing or speaking. The remedy provokes an abundant secretion of saliva, which moistens the mouth and throat. This local action of the borax should be aided by an equal dose of nitrate of potassium, taken in warm solution before going to bed.—*La France Médicale.*

POISONING BY CHLORATE OF POTASSIUM.—The Marseilles "Médical" relates a case of poisoning by chlorate of potassium. An elderly man took in mistake for Epson salts, thirty-five grams of chlorate of potassium. Death, which followed in seven hours after the ingestion of the salt, was preceded by the following symptoms: vomiting, colic, and diarrhœa, general weakness and rigidity of the limbs. After death the skin of the dorsal and lumbar regions presented a slate-colored appearance.—*Med. Times*, Jan. 29.

BISMARCK'S CAUSTIC POWDER.—

Arsenious acid,	15 grains.
Sulphate of morphia,	15 "
Calomel,	2 drachms.
Powdered gum arabic,	12 "

Mix. This is sometimes called *painless caustic powder*, although the propriety of the name is doubted by some.—*Gaillard's Med. Jour*, Jan.

DOBELL'S PURGATIVE TINCTURE.—

℞	Res. podophylli,	grs. ii
	Essentiæ zingiber.,	ʒi ♏xv
	Spts. vin. recti.,	ʒii

M.S. ʒi at night when lying down, every two or three nights. Podophyllin is claimed to act mildly.—*Gaillard's Med. Jour.*, from *L'Union Méd.*

LENT'S SOLUTION OF QUINIA.—

℞	Quiniæ sulphat.,	gr. 80
	Aquæ,	℥j
	Acidi sulphur. dil.,	q. s.
	Heat to biling and add Acidi carbolici,	gr. 5

For hypodermic use.

BURNS.—Dr. A. L. Barry, of Ringold, Ga., says that a solution of alum in water forms an excellent application to burns, relieving the pain in a few minutes, and leading to a rapid healing of the inflamed surface.

℞	Alum,	1 ounce
	Water,	1 quart

Sig. Keep a cloth wet with the solution constantly applied.—*Southern Medical Record*, January 20.

FETID SWEATING OF THE FEET.—Dr. Willcox ("British Medical Journal," vol. ii, 1880, p. 659) straps the affected portion of the sole of the foot as smoothly as possible with tolerably wide straps of ordinary adhesive plaster, either emplastrum saponis or emplastrum plumbi. Every part should be completely covered, and with two layers of plaster if the complaint be very bad. The plaster should be taken off and renewed in three or four days, and once again at the expiration of a week, when the skin will be found to be quite healthy.—*Medical Times*, January 15.

SALICYLIC ACID AS A FOOT POWDER.—As a protection to the feet, in the Russian army, salicylic acid is used. It is in the shape of a powder, and is a great preventive against perspiring and sore feet: Acid salicylic, 3 parts; amylum, 10 parts; powder of talcum, 87 parts. It is applied dry; on a march, daily; in garrison, every two or three days. It takes off the irritating influence of the perspiration of the feet, and prevents, in consequence, the soreness. In the Italian army aniseed is similarly used, in hot weather.—*Med. and. Surg. Rep.*, Feb. 5.

DIOSCOREA VILLOSA.—A correspondent in Iowa speaks highly of the fluid extract of this indigenous plant in bilious colic, and he relates a very severe case in which a teaspoonful dose gave immediate relief. The wild yam has long had a reputation as a "colic root." It is mentioned in the appendix of the United States Dispensatory, but as Prof Stillé remarks, in the last edition of the National Dispensatory, "Time has not added to our knowledge of its properties." He thinks its active principle is allied to ipecac.—*Ibid.*

PITTING OF SMALLPOX.—Dr. Schwimmer, in the "Gazette des Hôpitaux," advises a mask, to be formed of very pliable linen cloth, leaving apertures for the eyes, nose and mouth. The inside of this is to be smeared with one of the following liniments: 1. Carbolic acid, 4 to 10, olive oil, 40, and prepared chalk, 60 parts. 2. Carbolic acid, 5, olive oil and pure starch,

of each 40 parts. 3. Thymol, 2, linseed oil, 40, and chalk in powder, 60 parts. The mask should be renewed every twelve hours. Compresses impregnated with one of these mixtures may also be placed on the hands, and on any parts of the face with which the mask does not come into exact contact.—*Med. and Surg. Rep.*, Feb. 19th.

DUBOISIA POISONING.—Dr. E. L. Holmes ("Chicago Med. Jour," Nov. 1880) reports the following: A patient at the eye infirmary, during convalescence from a cataract operation, was provided with a small bottle of sulphate of duboisia, gr. i to the ounce. On the 27th of April, about 9 o'clock, in the evening, he took by mistake a teaspoonful of the solution. The patient at once informed other patients near him that he had taken the wrong solution, but concluded to await the result before reporting to the nurse. In about ten minutes there was dryness of the throat, and in half an hour a peculiar sensation in legs, then in the thighs, arms and other parts of the body as if they were asleep. At the end of three-quarters of an hour or more the patient could scarcely walk or stand. At this time a nurse was called and an emetic given with the apparent effect of entirely relieving the stomach of its contents. Without delirium the patient rapidly passed into a state of unconsciousness and remained in this condition till about five o'clock in the morning. He complained for two days of muscular weakness in the legs and arms, and especially a peculiar jerking action of the muscles of the arm in extending the hand to grasp a glass or other object. When Dr. Holmes saw the patient at midnight he was lying quietly in a stupor, from which he could not be aroused, but breathing naturally. The face was not specially flushed, although the mouth and tongue were remarkably dry. The temperature was normal The pulse varied from 108 to 112. The pulse always fell to 80 when the patient sat up in bed. An ounce of brandy was given during the night.—*Detroit Lancet*, Feb., p. 369.

POISONING BY NITRITE OF AMYL.—Dr. G. F. Senter ("Indiana Medical Reporter") reports the case of a young lady who, by mistake, took a dessert-spoonful of nitrite of amyl. A druggist gave an emetic that acted promptly. In twenty-five minutes the doctor saw her; she was ejecting large quantities of fluid from her stomach, which saturated the whole room with an amyl-like odor. Her face was grayish-white, her pupils widely dilated, her eyes glassy and vacantly rolling in their sockets. The mouth was wide open, breathing spasmodic and irregular; a few breaths would be very rapid, and then slow and long-drawn; finally, they ceased all rapidity and became barely preceptible. The pulse was irregular and jerking when first examined; soon, however, it became so slow and feeble that often it could not be detected at the wrist. The patient was "the most limp, limber, relaxed body imaginable." The skin was cold, clammy and suffused with a moist adhesive perspiration, supersaturated with amyl. The treatment was locally—message and warmth to the head and extremities, alternating with ambulation and flagellation; internally, after free emesis, hot coffee, sometimes with and sometimes without 10 drops of tinctura opii.—*Ibid.*

ANTAGONISM OF ATROPIA AND PHYSOSTIGMIA.—Dr. R. Bartholow ("Med. Record," Dec. 4, 1880,) reaches the following conclusions on this subject: 1. Physostigmia, or eserin, and atropia are antagonistic in their action on the pupil. 2. They are different, but probably not antagonistic in their action on the heart. 3. They are opposed in their effect upon the respiratory functions, eserin paralyzing and atropia stimulating it. 4. They are not opposed in their action on the cerebrum. Atropia produces delirium and hallucination, while eserin does not affect the cerebral functions; but both cause more or less carbonic acid narcosis. 5. They act differently, but not antagonistically, on the spinal cord and nerves, both cause paralysis; but while atropia impairs the irritability of the motor nerves, eserin does not. Eserin increases the irritability of the sensory nerves, while atropia, if it has any effect at all upon them, diminishes this. 6. They are antagonistic in their action on secretion, eserin stimulating it and atropia arresting it. Thus it appears that atropia overcomes the lethal effects of eserin, by stimulating the respiratory functions; but it is doubtful whether eserin is of any practical service in poisoning by atropia.—*Ibid.*

MINUTES OF THE PHARMACEUTICAL MEETING.

PHILADELPHIA, Feb. 17, 1881.

In consequence of the examination of junior students occurring upon the third Tuesday of the month, the pharmaceutical meeting was called for the following Thursday. On motion of Prof Remington, Mr. E. M. Boring was called to preside; the minutes of the last meeting were read, and, there being no corrections to make, were approved.

The Actuary exhibited a very compendious Stock and Cost Book, issued by Messrs. Richardson & Co., of St. Louis, by whom it was donated to the College. A vote of thanks for the same was voted to the donors.

Dr. L. Wolff made some remarks upon an improved method of obtaining the alkaloids of *Hydrastis canadensis*, which he thought worthy of notice by those making them. It consists in exhausting the root of the fatty oils by percolating with gasolin before proceeding to prepare the alkaloids; the advantage derived by this procedure is quite considerable; the purification and crystallization of the hydrastia is effected with greatly less trouble. An inquiry was made whether hydrastia had any remedial powers other than those of the tonic effects of the berberina associated with it, which was answered by a positive statement that the astringent effects and the control of unnatural discharges were due to the hydrastia, while berberina had a remedial power as a tonic and cholagogue of its own.

Prof. Remington showed a specimen of *monobromated naphthalin*, used for mounting microscopic objects. It is made by dissolving naphthalin in bisulphide of carbon, and treating with bromine; he also noticed an editorial in one of the city papers, commenting upon a proposed law directing physicians to write their prescriptions in English and without abbreviations, and also requiring apothecaries to write out the names of all the ingredients in a prescription, in full, and affix it to the vessel in which such prescription is dispensed.

The orthography of the unit system was again noticed by Prof. Remington in a paper which was referred to the Committee on Publication.

Dr. Wolff took the chair in response to a request from Mr. Boring to be excused.

Prof. Maisch alluded to the photographs of *medicinal plants*, mostly indigenous, which have been noticed in the pharmaceutical meetings of last year, and stated that at his suggestion Mr. Lochman had photographed a number upon glass, for use with the hydro-oxygen lantern, and that he had used them with entire satisfaction in illustrating his lectures during the past winter.

The meeting then adjourned. T. S. WIEGAND, *Registrar.*

PHARMACEUTICAL COLLEGES AND ASSOCIATIONS.

THE CONNECTICUT PHARMACEUTICAL ASSOCIATION held its fifth annual meeting in the police court-room at Waterbury, February 1st, President Goodrich presiding. After the president's annual address had been delivered the different officers and standing committees made their reports; the membership is about 200, and a cash balance of $682.47 was in the hands of the treasurer.

Mr. A. F. Wood read a paper on carbolic acid ointment, and a number of queries were accepted by members for report at the next meeting.

At the afternoon session a number of applicants for membership were elected; also the following officers to serve for the ensuing year: L. I. Munson of Waterbury, president; E. A. Gessner of New Haven, and N. D. Sevin of Norwich, vice presidents; Fr. Wilcox of Waterbury, secretary, and Geo. P. Chandler of Hartford, treasurer.

Mr. F. P. Dickinson of Hartford imparted considerable information regarding the best methods for preserving vegetable drugs, and Mr. J. G. Rathbun of Hartford reported a number of private and local formulas.

A code of ethics was adopted, and at the evening session it was voted to hold next annual meeting at Bridgeport.

Various committees were appointed, likewise five delegates to the American Pharmaceutical Association, and the president was empowered to nominate six members, from which number the governor may select the commissioners of pharmacy in case the pharmacy act becomes a law.

Mr. E. A. Gessner read a paper on the advantages of gelatin as a pill coating, and E. A. Smith a paper on *cream of tartar*. 20 samples, obtained at as many drug stores in three cities, proved to be merely contaminated with calcium tartrate, while of five samples, obtained from as many of the largest and best grocers, two only were contaminated with calcium tartrate, while the remaining three contained respectively 82, 70 and 42 per cent. of adulterations, consisting chiefly of starch, flour and chalk, besides the calcium tartrate.

After the reading of a paper by Mr. F. M. Wilson on wines and liquors supplied by wholesale dealers, it was voted to hold a summer meeting, the time and place to be designated by the president.

An interesting exhibition of drugs, chemicals and pharmaceutical preparations and sundries was made at the parlors of the Scovill House, the same hotel where the members took their meals.

THE IOWA STATE PHARMACEUTICAL ASSOCIATION held its second annual meeting at the Exhibition Building in the city of Des Moines February 8, the President, Mr. George H. Schafer, in the chair, Mr. W. H. Dodd Secretary. The morning session was devoted to some routine business and to the President's annual address. The afternoon session was opened with speeches by several members of the legislature who, a year ago, introduced and were active in securing the passage of the Iowa pharmacy law.

The following officers were elected to serve for the ensuing year: President, Geo. B. Hogan, Newton; Vice Presidents—A. R. Townsand, Boone; J. W. Ellis, Patterson; Jno. W. Ballard, Davenport; Secretary, H. W. Dodd, Fort Madison; Treasurer, C. H. Ward, Des Moines.

A vote of thanks to the retiring president was passed for his efforts in the organization of the society and the furtherance of its objects. A number of papers were read, and, on the following day, two sessions were held, and devoted mainly to discussions on legislation affecting pharmacy. The next meeting will again be held in Des Moines on the second Tuesday of February next.

The druggists and pharmacists of Des Moines entertained the Association at the Kirkwood House by a complimentary banquet, at which the Governor and other dignitaries of the State and city were present, and after ample justice had been done to the good things spread before the company, speech-making and toasting, and finally dancing was indulged in.

EDITORIAL DEPARTMENT.

THE DECENNIAL GENERAL INDEX of the "American Journal of Pharmacy" for the years 1871 to 1880, inclusive, is now ready, and will reach our subscribers with the present issue, free of charge. Extra copies of this Index may be obtained from the Business Editor at the price of fifty cents per copy. We also call attention to the General Index for the first forty-two volumes of the Journal, from its commencement in 1829 to 1870, inclusive, and including the preliminary volume published in 1825–27. This Index has been prepared by Mr. H. M. Wilder, and was published in 1873. The Publishing Committee has reduced the price for the remaining copies to $1.50 each, in paper cover, and $2.00 bound in cloth. By the aid of these two indexes all the volumes of the Journal can be easily consulted, and the large amount of information scattered through the latter, is rendered available. The two indexes will therefore be of great service to those possessing a portion or all the volumes, or desiring to consult them on special subjects. It may not be amiss to direct also attention to the reduced price at which

some of the earlier volumes are offered, a list of which will be found among the advertisements.

ORTHOGRAPHY OF THE METRIC UNITS.—The rejoinder by Professor Remington, published on page 100, calls again for a few editorial remarks, which we propose to make as brief as possible.

On page 10 Prof. Remington suggested to retain *meter* for a measurer and *metre* for the measure. It seems that our editorial remarks, quoted again on page 100, require a further elucidation, which we think can be rendered thus: "The measure for the met*re*, commonly called a met*re* stick or a met*re* tape, is a met*er*, or, perhaps still better, a met*re*-met*er*."

The history of the French word thermomètre, as given by Prof. Remington, proves the judiciousness of the French in adapting the orthography of words of foreign origin to that of their own language; and nothing more nor less is proposed for the English language in the case under discussion.

The case of gr. as an abbreviation for grain, and in France and Italy also for gram, is not stated correctly on page 101. We not only admit that such is the case, but we also assert that this identity has, to the best of our knowledge, never been the source of error in the countries named. What would be thought of a medical or any other writer who, in an article, would give both apothecaries' and metric weights, and then state, "Given in doses of *two gr.*," we leave our readers to judge.

The prescription quoted on page 102 is not in any recognized style; if intended for grain it would be written all the world over gr. i; if intended for gram it would be 1·00, without any further addition. The man who would put up such a prescription, dispensing one gram of morphia in ten powders, without previously consulting the prescriber, would deserve to be indicted for manslaughter; and the physician who would write such a prescription without other directions than those given, deserves to be censured. This case would be exactly parallel to the one quoted on page 103, of the merits of which we know nothing except what is there stated. It was evidently a mistake caused by carelessness on the part of the physician, and a gross blunder on the part of the assistant in dispensing 15 grams of a tincture containing 1·5 gram of opium, to be used in doses equivalent to 0·5 gram of the latter. If the assistant had acted with proper care no life would have been sacrificed, and the physician's mistake would have been discovered, and, of course, corrected. Mistakes and blunders similar to this one have been by far more numerous with the old signs designating apothecaries' weights and measures, and often not nearly as easily discoverable as in the above case.

Those who know the pharmaceutical literature of France, and, in recent years, that of Germany and other European countries, we think will agree that for simplicity, as far as the designation of quantities is concerned, it leaves nothing to desire, for all values are given in ordinary figures, and invariably mean *gram*, unless otherwise designated, for which there is rarely occasion, since, as a rule, all medicines are *weighed*.

From the foregoing it will be obvious that we do not approve of the abbreviation g. for gram, adopted by the Metric Bureau.

PHARMACEUTICAL LEGISLATION.—The law-makers are again at work in many States of the Union and, as usual, a large number of laws, good, bad and indifferent, are under consideration. A pharmacy law has been passed in W. Virginia on February 21, and similar laws are before the legislatures of Missouri, Illinois, Connecticut, Massachusetts and Pennsylvania. In the former three States we understand the laws are likely to pass; in Massachusetts, strange to say, much opposition has arisen on the part of a number of pharmacists and druggists in Boston. In Pennsylvania the bill which was drawn up by a Committee of the Pennsylvania Pharmaceutical Association, was reported back to the House by the Committee on the Judiciary general, with a negative recommendation, but it has been recommitted and may probably come up for consideration. In the Senate of the Pennsylvania legislature there is pending a very simple but very stringent pharmacy bill, allowing *only graduates in pharmacy* to compound physician's prescriptions; at the same time, the Committee of the Judiciary local, of the House of Representatives, has reported favorably a pharmacy bill for cities of the second class (Pittsburg and Allegheny). It would seem that, as far as Pennsylvania is concerned, these were laws enough affecting pharmacy, but in addition to those mentioned, there is to be another law, compelling physicians to write their prescriptions in plain English and without abbreviation; and still another law, compelling pharmacists and druggists to write or print the names of *all* medicines (which would include those furnished on prescriptions) on the outside of the vials, etc., in the English language and without abbreviations.

The enemies of the use of Latin in prescriptions have been silent for a number of years; in the JOURNAL for 1871, p. 141, and for 1872, p. 89, will be found some remarks on this subject; since then, feeble efforts have been occasionally made in one or two States to consign pharmacopœial Latin to an untimely grave; the present, as it seems to us, more vigorous effort, than for some years past, will doubtless meet with the fate of the former ones.

In California, it seems, a pharmacy bill has also been before the legislature with very little prospect of passing it. We have not seen a copy of it.

REVIEWS AND BIBLIOGRAPHICAL NOTICES.

Report of the Commissioner of Agriculture for the year 1879. Washington: Government Printing Office. 1880. 8vo, pp. 621.

This report contains a large amount of statistical, practical and scientific information on subjects connected with agricultural pursuits, which is rendered more useful by over sixty plates, a number of them colored. A large number of analyses are reported of grasses, fodderplants, juices of sugar canes and other substances, some of which may possibly be of medical importance, like the seeds of *Sophora sericea*, Nutt., from which an alkaloid was obtained that seems to be identical with the sophoria of Prof. H. C. Wood (see "Am. Jour. Phar.," 1877, p. 617; 1878, p. 39); the herb of *Astragalus mollissimus*, Torr. (*Ibid.*, 1879, p. 238), which seems to contain

a small amount of an alkaloid, and the herb of *Oxytropis Lamberti*, Pursh (*Ibid.*, 1878, p. 564), which has a sweet taste, but is of a tough, fibrous and indigestible character, and is on that account probably deleterious to cattle. Twenty-five species of indigenous and naturalized grasses, more or less valuable for forage and hay, and a number of insects injurious to the cotton plant and to orange trees, or otherwise of economic importance in their various stages of development, are described and figured. Various researches upon diseases of cattle and swine, a descriptive catalogue of the vegetable fibres in the Museum of the Department of Agriculture, and a report on the present status of fibre industries in the United States, form the concluding pages of the volume.

The Chemistry of Medicines, Practical. With fifty original cuts. By J. U. Lloyd, Professor of Chemistry and Pharmacy in the Eclectic Medical Institute of Cincinnati. Cincinnati: Published by the author. 1881. 12mo, pp. 451.

This work is intended as a text and convenient reference book for students, and also for physicians and pharmacists. It opens with a chapter on apparatus, giving descriptions and directions for their use, followed by a chapter on chemical theory, containing also explanations of physical phenomena and conditions (electricity, magnetism, crystallography, etc.), and of various processes, like evaporation, filtering, dialysis, etc. Then follows inorganic chemistry, divided as usual into the chemistry of non-metallic and of metallic elements, arranged into groups. The acids are all considered under hydrogen, as compounds of that element, and in alphabetical order, the latter arrangement being also used under the heads of the metals for their salts.

In the chapter on organic chemistry the compounds are considered as hydrocarbons, alcohols, ethers, aldehyds, carbohydrates, amines, alkaloids, glucosides, resins, oleoresins and volatile oils. The last few pages contain directions for the examination of urine.

All the important elements are described, but of the compounds those which have been employed in medicine are treated of, almost to the exclusion of others, a few important ones excepted. The limits thus drawn by the author have enabled him to give, in the space at hand, outlines of the processes, with many useful, practical hints, descriptions of the various compounds and brief directions for determining their purity.

An Elementary Treatise on Practical Chemistry and Qualitative Inorganic Analysis. By Frank Clowes, D. Sc. Lond., etc. Philadelphia: Henry C. Lea's Son & Co. 1881. 12mo. Pp. 372. Price, cloth, $2.50.

As a practical work, well arranged, instructive and useful in its details, we regard this work well adapted for the laboratory instruction of students of elementary chemistry. The opening section, on the preparation and properties of gases, is intended to afford opportunities for chemical manipulation and practical illustrations of the elementary portions of theoretical and descriptive chemistry. The second and third sections give instructions in the preparation and use of apparatus required in chemical anal-

ysis, and in the various analytical operations. The fourth section contains the analytical reactions of the metals and acid radicals, and a commendable feature of it is the introduction of tables of differences, giving for each group of metals, in tabular form, the behavior to each of the reagents employed for the different metals. This latter subject we believe is often more or less neglected, but in our opinion might be even further extended with benefit to the student.

The two following sections explain the course of analysis for simple and complex compounds, and in the seventh section we find lists of apparatus and reagents, directions for preparing the latter, etc. The rarer elements are treated of, according to their reactions and detection, in the appendix, which contains also instructions on the use of the spectroscope and various tables.

Handbook of Systematic Urinary Analysis, Chemical and Microscopical. By Frank M. Deems, M.D., laboratory instructor in the medical department of the University of New York. New York: Industrial Publication Co. 1880. 12mo. Pp. 30. Price, limp cloth, 25 cents.

A very convenient table, giving also sufficient details for the intelligent recognition of the various constituents of urine and urinary deposits. It is not intended to take the place of larger works, but it is well adapted as a guide for practical work.

Drugs that Enslave.—The Opium, Morphine, Chloral and Hashish Habits. By H. H. Kane, M.D. Philadelphia: Presley Blakiston. 1881. 12mo. Pp. 224. Price, $1.50.

Although there are several good works describing the danger of the habitual use of opium and similar drugs, there is ample room for the further ventilation of this subject, the more so since the consumption of narcotics has evidently considerably increased of late years. The work is primarily written for the use of physicians, but it contains also so much of interest to the pharmacist and intelligent persons generally that we believe it to deserve being read by those who feel an interest in discouraging the use of these dangerous drugs. But little space has been devoted to the study of the hashish habit owing to its rarity in this country. The book is embellished by an excellent phototype frontispiece of Laocoön.

Aphorisms in Fracture. By Richard O. Cowling, A.M., M.D., Professor of Principles and Practice of Surgery, University of Louisville. Louisville: J. P. Morton & Co. 1881. Pp. 70. Price, 25 cents.

This is the second of Morton's pocket series. The aphorisms were read before the Kentucky Medical Society in 1877, but have since been revised and extended.

Biographical Sketch of James Aitken Meigs, M.D. By Geo. Hamilton, M.D. Philadelphia: 1880.

A reprint from the transactions of the Medical Society of the State of Pennsylvania.